Reflections

Teaching in Architecture

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University of Illinois at Urbana-Champaign

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Reflection (ri flek shen) n. 1.) The act of casting back from a surface. 2) To happen as a result of something. 3.) Something that exists dependently of all other things and from which all other things derive. 4.) To look at something carefully so as to understand the meaning.

Contents

The School of Architecture would like to thank Ryoji Suzuki for the contribution of his drawings to this issue of **Reflections.**

The Studio Game and Its Play

John Naughton
University of Illinois
Chicago

Think of a typical studio environment today. Visions appear: Instructors challenge students to develop creative and practical solutions to a variety of problems. Students struggle to determine the facts, rules, and limits that constrain their "creativity." Some appear to discover "loopholes" that free them to work. They seem clever, more imaginative. Others accept the constraints literally, and though frustrated by the restrictions, struggle to a workmanlike solution. Still others never quite comprehend the "game."

Studio reviews illustrate the apparent contradictions between problem solving and originality. Routinely, students are disappointed by what they perceive to be arbitrary judgments during reviews. Some of these slip into the comfort of the more technical areas where they feel more confident of finding "right" answers.

A question comes to mind, in light of this somewhat cynical although legitimate interpretation: What is the basis that makes such a decisive characterization accurate? Clearly, students are being sent mixed signals. The most cursory of reviews illustrates the overwhelming emphasis that architectural curricula place on courses geared to information gathering, memorization, and technique. The criteria for judging comprehension in history or technology, for example, is often the student's Pavlovian response to stimulus. Indeed, those courses still labeled "Liberal Arts" are commonly offered early in curricula so that students might "get them over with." Virtually nowhere, outside of studio, are students asked to interpret situations, make personal judgments (frequently moral), think in terms of qualities like appropriateness and image, while also thinking about keeping water out, shading coefficients, or economy of spans. And, at the end of this paradoxical experience, these same students are asked to acquit themselves of any arbitrary decisions through their drawings, an often less than adequate means. Surely this is hell for all involved. So the next question seems to be, given the overwhelming cultural pressure to reduce everything to quantifiable bits of information, and the anxiety that the present studio form generates, what earthly purpose is served by retaining it?

Following the pattern of the sciences, studios could be replaced with laboratories. Sophisticated computer programs could be used to catalog and store quantifiable information of virtually every kind; historical and spatial typologies, energy and siting data, material and detail inventories, program and space relationships. Problems might reduce to tests of retrieval dexterity and information assembly. Preestablished, objective criteria might account for all judgment calls. Student/instructor anxiety might be replaced with a training procedure that, if followed, could lead to successful problem solving. What would be lost? Well, primarily, the students and the teachers are lost.

The price paid for "objectifying" information in the manner described above is the reduction of education to instruction. In this

reduction, qualities are replaced by characteristics. Scholars of architecture are replaced by instruments in a process, be they trainer or trainee. And, what would be gained? Only an illusion.

The illusion that objectivity provides is that it removes responsibility for choice. But, the burden of choosing never passes away.

More than we may care to admit, architecture may simply be a mirror held up to our choices and, ultimately, a reflection of our values. Choosing the character of a space, for example, is only the result of having reflected on and chosen the purpose to be served. This is practical reflection that, in the practice of architecture, leads to social and moral decisions that surpass in importance any technical issue.

Naturally, the skillful representation of our choices is important. As such, the mastery of techniques constitutes an important aspect of architectural education. The scholar must be able to draw, model, and assemble precedents as well as materials. However, no amount of skill spares the scholar the work or the responsibility of pondering and ultimately choosing.

Choosing is a fundamental creative act. To choose is to create a particular mediation of one's understanding as representative of one's vision. It is the establishment of relationships to things, ideas, situations. Studying architecture is not simply standing alongside it, observing the tradition as if an object. Establishing a relationship to the tradition of architecture requires locating oneself in that tradition and producing it. Choosing a vision of the tradition of architecture represents an interpretation of one's circumstances in that tradition.

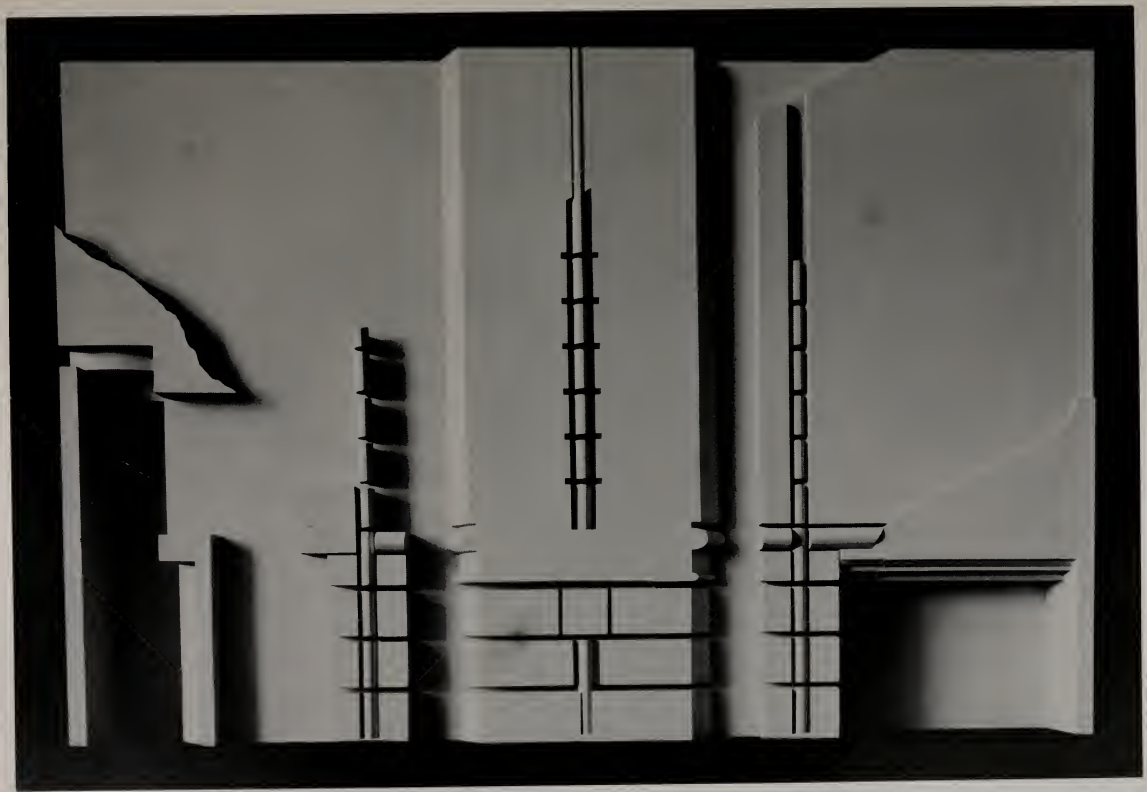
To understand the game in studio then, is to recognize that architecture is full of choices. To play it creatively, one must accept responsibility for choosing. This means that not only are attempts to remove anxiety from the studio by removing responsibility for choice absurd, they are anticreative. It appears then, that the solution to the problem of studio anxiety does not lie in searching for objective essences. Rather it lies in finding ways of coping with the apparent relativity of traditions, forms, manners of speaking, and ways of seeing.

Playing the game in studio by choosing a practice of understanding that considers the architect to be an interpreter will develop a way of coping. It will be productive, neither attempting to reconstruct the circumstances or intentions of previous builders nor to give priority to their authority. Rather, the game will recognize the ability of player/interpreter and artifact to choose to assert themselves in the present over and above previously attached meanings. Choosing to understand architecture in this way, without priority given to its originating polemic and illuminated by the present, makes it new and its relationship to the scholar creative. The choice of this kind of relationship will contain strangeness and familiarity, remembering and reason. There will also be productive understanding. Play in these circumstances will provide the mind with fresh sensitivity enabling it to remain open to possibilities and imaginings. Method takes a secondary role to the forgetive idea, that is, the idea whose sources of creativity are a unique combination of vague remembrances and individual vision. Limits imposed by valuing aptitude for procedure are lifted and the inventive editorial potential of imagination begins to construct new expressions as an understanding of the familiar.

As the game of architecture is composed of relationships, analysis will continue to have a dominant role. However, playing the game will lead to a transformation of that role. The game must stay rooted in daily life for it to be played seriously. But, it must also remain transparent to it or it will quickly become rule bound. Accepting the limits of traditional constraints subverts play and reduces it to problem solving. Choice and responsibility for it are quickly masked. The scholar is reduced to an instrument whose role is limited to reaching the predetermined end, be it based on a specific notion of economics, minimum standards, technology, or the like. The reality of architecture is that its compo-

sition is not fixed. To keep the studio anchored to this reality, the scholar must keep visionary goals and must maintain a sense of balance that deals with both general and specific: a balance that includes public housing in a discussion of the room, picnic table in a discussion of a park, and dining hall in a discussion of the ritual of eating. When the game is played from shifting perspectives, a sense of inquiry will prevail over the anxiety of uncertainty, and interpretation over explanation. In the process of playing, practical reason can be creatively pursued without being caught by it.

I am suggesting that the architecture studio be considered as a game most productively played in circular form. It seems that a circle allows a dialogue to develop freely between architects and the work before them. For the studio to embody this practice creatively, it must engage this dialogue at every level. In the mode of conversation there is an implicit sense of common interest that is being served. Architects who lead and are lead by their study do not seek answers as much as the varied perspectives that circles offer, perspectives that, in the words of philosopher Richard Rorty, keep "space open for the sense of wonder that poets can sometimes cause—wonder that there is something new under the sun, something which is not an accurate representation of what was already there, something which (at least for the moment) cannot be explained and can barely be described!"



Ryoji Suzuki

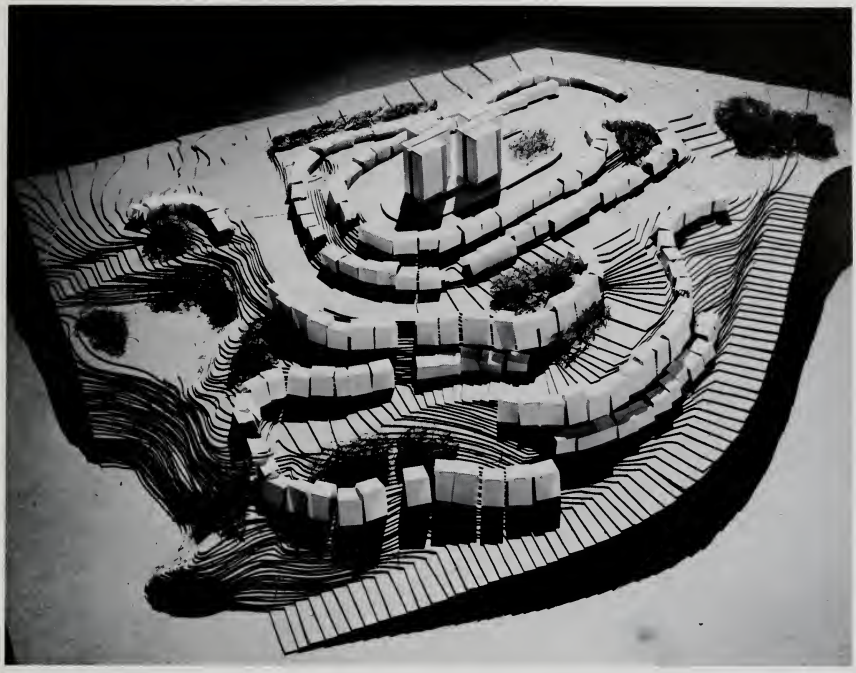
The Work of William Eng and His Approach to Design Education

Lydia M. Soo
University of Illinois
Urbana-Champaign

On view during the fall of 1986 at the School of Architecture of the University of Illinois at Urbana-Champaign was "The Work of William Eng: A Retrospective Exhibit," consisting of nineteen competition entries designed by this professor of architecture while at the UIUC. Held as the school's special event in celebration of the Diamond Jubilee of the Association of Collegiate Schools of Architecture, it was also featured at the 1986 ACSA West Central Regional Conference.[1] The sponsors of the show, the ACSA and the School of Architecture, could not have found a more eloquent display of their goals than in this exhibit of drawings and models representing the significant contribution William Eng has made to architectural education.

According to Eng, the exhibit would have been better named "The Works of William Eng and Associates." This is because each project selected for display was designed in collaboration with UIUC professors and students at some time since 1960 when Eng joined the faculty. The one exception was his 1948 second-prize-winning submission to the Jefferson National Memorial Competition, better known by Eero Saarinen's winning entry, the St. Louis Gateway Arch. Designed with two classmates while still a graduate student at the UIUC, this project brought him in contact with the work of the Saarinens, leading him to seek another degree at Cranbrook Academy of Art in Michigan under Eliel Saarinen. In 1949 Eng went from Cranbrook to the University of Pennsylvania as a design professor, and also to the office of Louis I. Kahn. He remained in Philadelphia until 1955 when he moved back to Michigan to work for Eero Saarinen and Associates in Bloomfield Hills. In 1960 Eng returned to the UIUC as a member of architecture faculty.

Eng credits his commitment to the competition type of project, as well as his approach to design, to the "fresh air" of his experiences with these progressive firms and schools of the 1950s. From the same training came architects like Gunnar Birkerts, Cesar Pelli, Kevin Roche, Robert Venturi, Warren Platner, Paul Rudolph, Robert Geddes, and Romaldo Giurgola. Although competitions were the basis of the Beaux-Arts system, under which Eng was educated during the forties at the UIUC, he believes the methods of design it taught left much to be desired. "This system was restrictive. You used to spend nine hours locked in the *loges* to commit yourself to a scheme—an *esquisse-esquisse*. Then you spent six to eight weeks trying to unravel the sketch, to make sense of it—it was ridiculous. Without research, knowledge of the program requirements, and so forth, it is impossible to design. When we no longer followed the Beaux-Arts system, it was a revelation."[2] Eng admits that the French system produced many good architects in the forties and fifties, even progressive architects like Kahn and Eero Saarinen, but it had many drawbacks. "It forced you to commit to a concept, but you made the sketch vague so you could interpret it either way later. It taught you to make a non-committal sketch." Eng recalls Eliel Saarinen saying that, "The shortcoming of the Beaux-Arts system is that people don't have enough information to commit to a solution."



Diamond Heights Red Rock Hill Competition, Spring 1961, San Francisco, California

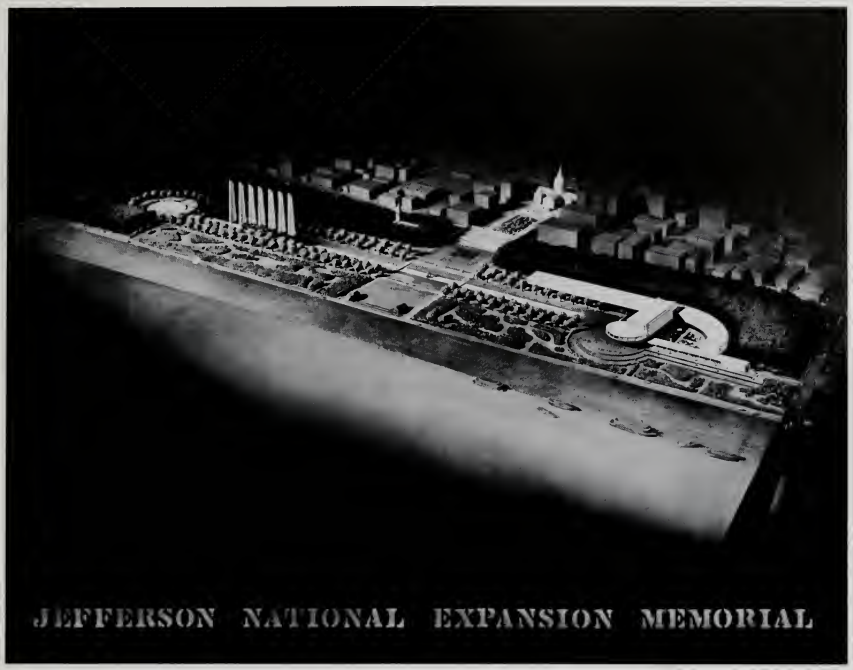
Eng, Day and Associates
William Eng, Norman Day, Principals
Charles Gordon, Tad M. Janowski, Carl Nelson, Associates
Ralph M. Line, photography, Consultant

This solution for the residential complex of 990 apartments in the center of San Francisco was among the ten winners. It involves a series of low-rise and intermediate-rise units organized in a serpentine form. This linear grouping continuously wraps around the hill, following the topography and reinforcing the movement system. At the top of the hill the scheme culminates in the center with a group of high-rise towers, resulting in an image that reflects the spirit of Mont St. Michel.

While practicing with Eero Saarinen, Eng worked extensively on actual design competitions. The Saarinens had built their reputations on international competitions, like the Tribune Tower Competition of 1922 which won Eliel second prize and which brought him and his family to the United States from Finland. He and his son Eero teamed up on competitions during the 1930s and 1940s and then Eero continued on his own, winning many, like the St. Louis Arch and the London Embassy. Members of his office, including Eng, were all involved in competitions, whether at the office or at home. At Saarinen's office these and other projects were pursued using a systematic approach developed through years of experience, which Eng transferred into an educational context when he joined the UIUC. Eng's work as a designer and critic can be seen as an outgrowth of the methods of the Saarinens, confirmed and refined by his own experience of over twenty-five years. As an architect Eng prefers to work on competitions, usually one or two each year, because they offer projects of a nature and scope which the average office does not provide. He selects those that challenge and "stretch your knowledge," especially cultural facilities, educational institutions, housing, and urban design. As a critic Eng has been involved for many years with student competitions, especially the graduate competition studio, which every spring produces several winning entries in the Paris Prize and Van Alen International Competition, both sponsored by the National Institute of Architectural Education.

In his roles as designer and critic Eng advocates the same design approach, whether for an international competition or real commission, or for a student competition or hypothetical project. The competition does have a more crucial time schedule than a normal project. "Perhaps it makes you form the habit of searching for an appropriate answer for a final solution," he suggests. But he believes that every practitioner and every student should do this in any project: "He should be concerned with not just fulfilling the needs of the client, but also with what a project does to advance the profession." In both his own work and his students' work, Eng believes in a design approach consisting of "research, concept generation, development, and presentation." The basic tool of his approach is not drawing, but the model. Within this process, Eng believes, the crucial step is concept generation using models.

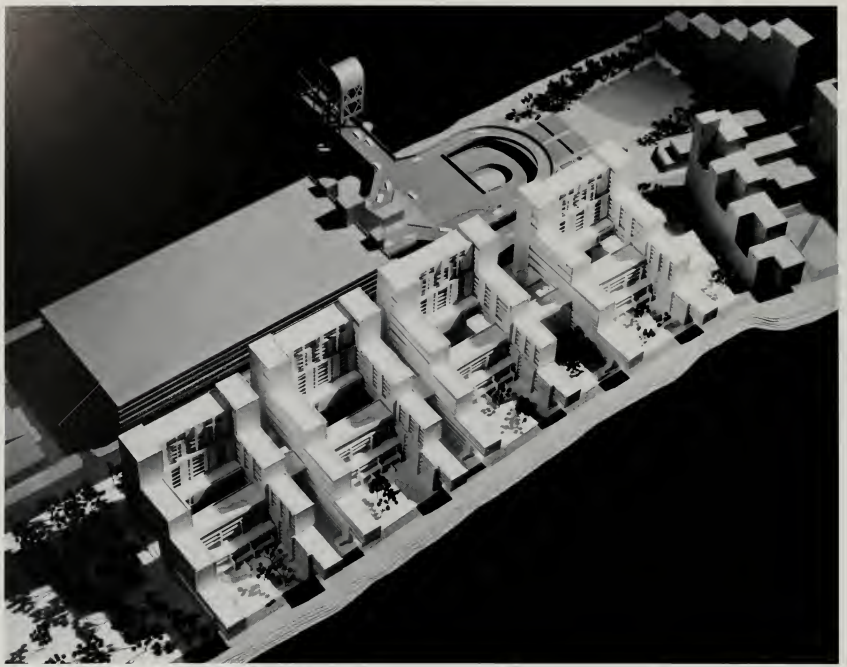
Eng derived his idea of concept from his experiences with Eero Saarinen and Louis Kahn. After presenting a scheme to Kahn, Eng recalls that Kahn asked, "What is your concept?" This is a subject that has challenged Eng ever since. He says that the Beaux-Arts system taught him the idea of "scheme" or "parti," but "I didn't really understand concept until I worked with Kahn." Eng defines concept in two ways, first as "a general statement giving guidelines to lead you into the investigation," and second as "some sort of graphic configuration or three-dimensional armature, resulting from an analysis of the program, which denotes the direction of the design." It is "an overall organizing principle or idea," by which every subsequent design decision is judged. Thus when designing each detail, one searches for what is most appropriate in terms of the particular concept. Eng believes that there are a limited number of concepts, found in the past and the present. There are five basic concept organizations, as he calls them, or "spatial organizations," as they are called by Francis Ching:[3] centralized, linear, radial, clustered, and grid. To these Eng adds a sixth—the geometrical form. During concept generation, the designer "must see how each direction responds to site constraints, the contextural conditions." After a concept organization is selected "the interior movement system must be identified. It is related to existing site constraints—how people travel, where they will enter the building, where service will come in—these will all link to the internal movement system. Then different activity zones can be assigned along the movement system in their proper location. A structural bay system and vertical circulation system are also established. In this way the concept will express the hierarchy of the programmatic space requirements." Eng gives the example of the linear concept or "spine," used in his scheme for the Pahlavi



Jefferson National Expansion Memorial Competition, Spring 1948, St. Louis, Missouri

Eng, Phillips and Associates
William Eng, Gordon A. Phillips, Principals
George N. Foster, Associate
Stanley White, landscape, Ralph M. Line, photography, Consultants

This second-prize-winning entry for a monument on the western bank of the Mississippi River memorializing Thomas Jefferson and the Louisiana Purchase is organized around an inverted T-shaped mall. The mall creates a single coherent organization unifying the existing historical buildings on the perimeter of the site—the courthouse and Old North Church—with the proposed structures: amphitheater, monument, museum, and restaurant. The overall organization is further reinforced by the belt of trees located between the pressures of the city traffic and the tranquility of the mall.



Roosevelt Island Housing Competition, Spring 1975, Roosevelt Island, New York

Eng, Fash and Associates
William Eng, William L. Fash, Principals
Larry L. Smith, Carlos F. Botero, Robert E. Hill, Burin Srisook, Stephen R. Hahn, Laverne E. Hanson, Jr., Associates

This entry for mixed-income, highrise apartments with 1000 units and support facilities was one of thirty selected for exhibition in "The Outstanding Entries of the Roosevelt Island Housing Competition," sponsored by the Architectural League of New York. The scheme consists of four double interlocking U-shaped structures stepping up from the shore of the East River to the main street, interconnected by an upper-level walk and passive recreation platform. There are three different zones of housing arranged vertically, meeting the diverse needs and social patterns of the various income groups, but dispersed in such a way to form a total complex. At the ground level, a pedestrian concourse extends the entire length of the site and links the interior and exterior amenities of the site to the river front promenade. Common facilities are located at this level to encourage interaction among all members of the community.

National Library competition. "Symbolic spaces can pop out along intersections of the movement system or along the sides of the building to give it an identifiable expression. Or these spaces can be used to terminate the system." Eng believes concept is an independent organizing principle, universal to all architecture, classical, modern, and postmodern. Postmodernism, Eng believes, is a philosophy that "deals with fenestration, not organization—concept is building configuration," which is common to every theoretical stance.

In Eng's opinion concept generation is a critical step in all design problems. Architects or students "have certain preconceived notions, so take a direction they feel comfortable with, then test to see if it will work, and through this process arrive at a completely different concept." This approach of first working with a familiar organization is a beginning, but must be taken much further by testing every possible configuration. Eng believes, "If you try each concept, then as you go deeper, all becomes clarified, and you end up with something different—this all means searching for a direction." Eng believes that "there is no such thing as the solution—there are many directions. There are no limitations except your own imagination." He says, "Ideas are a dime a dozen. You can't just wait for the concepts to 'bubble up' to consciousness, as Edward White says in *Concept Sourcebook*.[4] You need to generate them actively and systematically, exploring what you like and what you don't like. Don't leave any stone unturned." In a typical studio, Eng will ask his students for six concepts, followed by six more. "I never give a concept, it must come from the student," he says. "Some critics pass on their pet idea—I don't believe in the master critic situation." This is because the final choice of the concept depends on "how the individual interprets the type of facility. Assuming there are numerous ways you can generate concept, how you as an individual feel about the direction" becomes the basis for what concept is chosen. This means that a designer must explore every possibility to discover what he believes in. Eng says, "The selection of a concept is very personal, so everyone should come up with their own direction."

Concept generation is the most important step in the design process—"It is the search for an appropriate scheme" by the individual designer. Eng gives the example of Eero Saarinen who operated using a design team which would isolate ideas for him. By seeing these options he would arrive at completely new concepts. Moreover, "his preconceived ideas would cause him to dig deeper," Eng says. "It was a challenge—to outdo an idea." Louis Kahn, even when a house had been accepted by a client, would suddenly be dissatisfied and start over in another direction. This sort of search, Eng believes, should take place during concept generation, but also at every subsequent stage of design. In his work Kahn would go through a series of options for every design decision—it was a "search for the appropriate answer, whether concepts or details of fenestration." Eng takes these methods further in his own work, pursuing concept generation and development systematically because he believes that "architecture is the search for form and image." In this creative search, concept is the first step, limited only by the designer's creativity.

What is unique about Eng's idea of concept is the use of models at this early stage. He believes that models are crucial during the entire design process, not just for final presentation. During his education under the Beaux-Arts at the UIUC, he used quick clay models during development, but these were given less emphasis than the final model, built after the design was complete. Most architects still do this. "This is an inappropriate use of the model," Eng states. "The final model simply reflects all the unresolved problems." He is adamantly against the Beaux-Arts type of rendering, now revived today, and computer graphics as well, as a substitute for the three-dimensional model. "When a beautiful drawing is the goal, this hinders resolving the architectural problem—you only kid yourself and fool the client." Models should be used at all stages of design, beginning with concept. Ideas are generated using quick rough sketches, but more important, "You must have a study model from the beginning so you have an idea of the building configuration." Models are an essential "study aid" in concept generation, followed by further study models during development. In his

own projects and his students' projects, "no final presentation drawings are made until all problems are resolved in 3-d" and after the final model is built. He believes that hardline pen and ink drawings are the best form of graphic presentation, giving "precision drawing of the architectonics," often zip-a-toned with color, which allows one "to apply color without being a slave to color as in renderings." A drawing, however, is never a substitute for a model.

Eng first used models extensively in the Jefferson Memorial Competition, where the final rendering was drawn over a photograph of a clay model. Later he discovered that both Eliel Saarinen and Louis Kahn required the use of numerous models in addition to drawings during the design process. For Eero Saarinen design development using primarily models "was not a major issue until the TWA Terminal." During that project "every designer was given a set of exacto knives and a box of blades," Eng remembers, in order to generate alternative solutions first in model, then recorded in drawing. This was the first time study models were extensively used in Saarinen's office, especially large-scale models, often half of the building at 3/4" = 1' or larger, and even full scale mock-ups of details, a technique used by Saarinen throughout the rest of his career and adopted by his followers. But even more important, Saarinen always used models for generating concepts. "Each worker would develop quick concept models and then take them into Eero's office." Eng credits the European architects of the Modern Movement like Gropius, Mies, and Moholy-Nagy for the development of the model as an important design tool. Nevertheless he finds that most architects and students build models only for final presentations. The use of models for concept generation may be unique to the graduates of Saarinen's office, like Eng, and to their students.

Eng applies his design method, revolving around the idea of concept and the use of models, in his own work on competitions and in teaching students in competition studio and regular design studio. In their projects his students undergo the same process of concept generation, development, and presentation, working extensively in model at all stages. In competition studio, where a complex project often lasts only six weeks, the demands are even greater and a strong concept even more crucial. "The student needs to be strong in concept, be able to develop a project in a short time, and have the skills to make a decent presentation."

For national and international competitions, Eng usually involves other faculty members and graduate students. Students selected to be on these teams are given a unique learning experience due to their treatment as equal partners. While their role includes the "coolie labor," like library research, site models, conversion of program requirements into graphic form, and other tasks necessary for receiving course credit, in the design of the building they operate as equals with the faculty members. Eng recalls that after Eero Saarinen won the London Embassy Competition he asked Saarinen, "What is the secret to success in a competition?" Eero's answer was, "You need all resources under your command—man-power and brain-power." For Eng this includes the abilities not only of faculty acting as associates and consultants, but also of students: "You can get ideas from students—you can learn as equals." A good example was the team for the Pahlavi National Library competition, made up of two faculty members and four graduate students. "We would consult and vote as associates. We had a concept review every week when everyone had to present. We would learn from each other as equals through discussion—we had equal veto power." The final concept was decided as a group. "When it was settled, everyone had a special assignment, even the critics—site plan, plan, sections and elevations, axonometrics, or models. All worked to reinforce the final project. There was no longer one individual, but a group effort. This allowed consistency in concept, development, and presentation." In these competition teams Eng has the additional role as coordinator. This system ensures Saarinen's ideal conditions, all resources operating under Eng's command, but with equal effort required from all team members and equal credit given to all.

The type of design experience students receive from William Eng, whether as members of his competition teams or as students in his studio, is intense, disciplined, and demanding. It is also rewarding in that it provides a framework that demands creativity. Eng believes that the approach to design which he teaches, derived from his work with Kahn and Saarinen, is similar to the approach used by other graduates from Saarinen's firm in the fifties. It allows a long and deep search for an appropriate final scheme, a kind of search undertaken only at design-oriented, cutting-edge architectural firms. In fact, Eng's students who have graduated and gone on to work for such firms often comment, "It's just like design studio with Eng." Eng emphasizes that he uses a design "approach." It is based on the belief that with a thorough understanding of the problem—through research, through the exploration of every possible concept, through the study of every alternative during design development, and through sustained use of models—"an appropriate answer for a final solution" can be found. Because design is a free "search for form and image," he advocates a framework that allows this to take place, not a didactic theory or method. Within this approach centered on concept any philosophy or style can be interjected. Eng says, "I don't believe in a single philosophy—each project has a philosophy in itself," limited only by the creativity of the designer. This attitude is evident in the enormous diversity of Saarinen's work, who, as Eng says, "was searching for the most appropriate solution, which depended on the nature of the project itself." The competition entries designed by Eng and his associates show that this design approach based on concept and model allows the nature of the specific problem, united with the particular values and creative sensibilities of the designers, to find their most appropriate expression.

Notes

1 "The Work of William Eng: A Retrospective Exhibit" was held in the Temple Buell Architecture Gallery at the School of Architecture, University of Illinois at Urbana-Champaign, September 23 - October 23, 1986. The ACSA West Central Regional Conference was held at the UIUC, September 23-27, 1986.

2 All quotes are taken from three interviews by the author with William Eng, held on October 17, 1986, January 2 and 22, 1987.

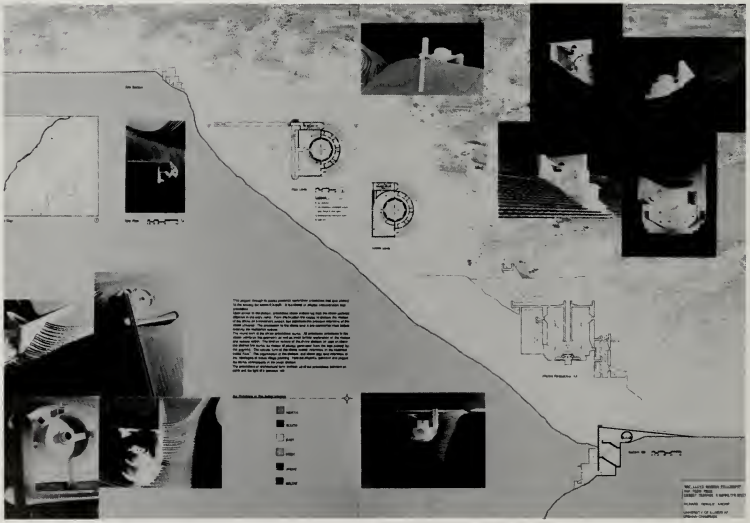
3 Ching, Francis D. K. *Architecture: Form, Space, and Order* Van Nostrand Reinhold (New York) 1979, p. 205.

4 White, Edward T. *Concept Sourcebook* Architectural Media (Tucson) 1975, p. 18.

A Tribute to William Eng

Student Projects from the 1987 Paris Prize Competition Lloyd Warren Fellowship

Desert Passage



Richard Ronald Knorr

Mark Edward Dixon

Phillip Lee Miller

Walter Peterhans and the Legacy of Visual Training

Dennis E. Domer
University of Kansas

The Bauhaus master teachers remained in Germany as long as they could after Adolf Hitler closed their famous school in Berlin in 1933. Eventually they had to leave because they were on the losing side of an ideological battle which transformed every segment of German society to reflect Nazi values. Not to adhere to those values resulted in imprisonment or extermination. Some, such as Gropius, Mies, Breuer, Albers, and Moholy-Nagy, fled to America where their fame preceded them. Their contributions to American architectural and design education became central to the modern legend which these famous men created by unabashedly seeking maximum publicity for their buildings and books and denouncing competing philosophies and styles. The egocentric tactics of the famous crowded the not-so-famous Bauhaus masters into the shadows of modern American history, even though they too had made important contributions to American architectural education. In fact, the not-so-famous often had as much to offer as the famous.

One of these relatively unknown masters was Walter Peterhans who taught photography at the Bauhaus from 1929 until 1933. His objet trouvé photography rivaled the work of the best of the avant-garde photographers in significance and surpassed most modernist photography in technical quality. Indeed, Mies recognized Peterhans as "a photographer second to none,"[1] but none of this talent counted in Nazi Germany where Peterhans could hardly make a living, even after having built a thriving business in Berlin during the 1920s. By 1937, the situation was hopeless for Peterhans. He was forty and growing desperate. Downtrodden and exasperated, Peterhans joined the stream of German émigrés to America in 1938 where he had no job, no prospects, and his accent automatically made the authorities suspicious. He hoped to continue his career as a photographer, but that was a naive hope. The American immigration ser-vice confiscated his cameras upon his arrival in New York, and Peterhans was left with only his suitcases, very little money, and a creative talent unrecognized on the American continent. It was a bad start in a land he could not like after he lost his cameras. Unfortunately, there could be no turning back to Germany.

Instead, Peterhans turned for work to Mies who had just been appointed head of a new school of architecture in Chicago. Mies's appointment was a lucky break for Peterhans because Mies needed faculty who already understood and worked comfortably in modernist expression. One of the first problems Mies faced was finding faculty to teach basic skills to American students who, in Mies's words, "appeared to understand what I said about the importance of proportion but did not demonstrate the slightest sense for it in their exercises."[2] Peterhans was not an architect, but fortunately for Peterhans, Mies did not necessarily need an architect to develop visual understanding and technical capability among beginning architectural students. To train the eyes of architectural students at the Armour Institute, Mies needed a disciplined teacher who had high

Frontispiece

standards, a visual thinker who had tested technical skills, and a well-educated person who could build a basic curriculum on a philosophically sound basis. Mies knew Peterhans personally and knew he was qualified because of his teaching experience at the Bauhaus, his professional stature as an exceptional photographer, his insistence on technical precision as evidenced in his photography, and his university education in philosophy and mathematics.

Peterhans's appointment at the new school in Chicago was successful beyond Mies's wildest dreams. The Visual Training course which Peterhans developed at IIT has been taught successfully without interruption since 1939. Peterhans's course has produced a legacy of student work that, as a whole, is an outstanding collection of modern art. Through Visual Training many students have obviously learned the Miesian grammar, even as they might learn German, and some know and display it better than others. Many critics of Mies share Kenneth Frampton's view that the disciples of Mies were generally "unable to grasp the delicacy of his sensitivity, that feeling for the precise proportioning of profiles."[3] I believe that the Miesian language was learned well in most cases. However, the artful solutions created in Visual Training frequently did not inspire equally artful solutions in architecture.

The Exercises

Peterhans developed ten visual exercises for students to complete over a period of four semesters. Each of these exercises had from three to five sub-exercises or variations of the main problem. All solutions had to be arranged on a white 20" x 30" board. The top of the board was the 20" side so that the presentation was a vertical rather than horizontal arrangement of design elements. These exercises were designed to teach students lessons about the creation of proportion, form, color, texture, and space. Peterhans wanted the exercises to be "abstract enough to reveal visual qualities isolated from each other" and "raised out of the manifold involvements in which they generally occur in architecture, in industrial forms, and in the fine arts."[4] While these exercises were designed to produce technically proficient students who could respond to practical conditions, Peterhans wanted the exercises "to present visual quali-

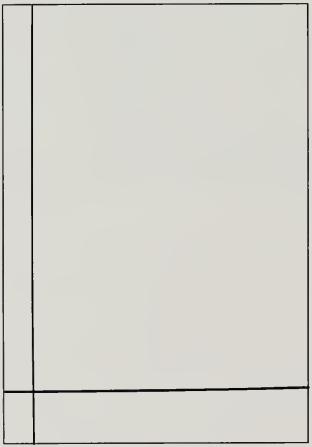


Figure 1

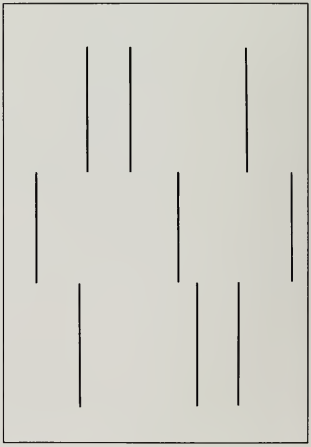


Figure 2

ties and relationships in a pure form, intensified in the highest degree, straining toward ripeness and fulfillment, so that they attain perfection, as it were, by themselves and in free accord and cause the technical means and conditions, at last, to be forgotten."[5] Thus it was Peterhans's challenge to teach students how to see by requiring artful solutions achieved through technical and precise means. This was the basic path to much of the Miesian architecture that has come from the architectural firms founded by many IIT alumni during the last 50 years.

The first exercise (Fig. 1) was a two-dimensional lesson in seeing the relationship between rectangles made apparent on the white board by the location and width of two black lines made of paper. The changing nature of this relationship could be studied in sub-lessons by moving first one black line and then another. However, every solution had to keep the rectangles balanced so that both read clearly and individually, yet made up a unified composition while possessing some hierarchy of visual values. The student learned what changes in the black lines made one rectangle or line stand out over the other, how shape and tension affected the hierarchy, the qualities of symmetrical and asymmetrical composition, and the value and necessity of technical precision in achieving visual solutions. Peterhans was a very careful critic of technique, and, after long contemplation, often moved a black line a millimeter or so to the left or right to create a more perfect proportion. These minuscule changes suggested the strong visual discipline students needed to achieve in order to adopt an attitude that admitted only the essential. Mies noted that "all fussiness and sloppiness disappeared from their work; they learned to discard any line that did not fulfill a purpose, and a real understanding of proportion emerged."[6] In Figure 2, one solution to the second Visual Training exercise explored and experimented with a greater complexity of relationships by increasing the number of black lines and possible rectangles. The lines and rectangles had to be arranged in three rows on the board. The variables were the height and width of the rectangle, the thicknesses of the black lines, and variable proportions and rhythms created through changes in and between rows of rectangles and lines. The student could

Figure 3

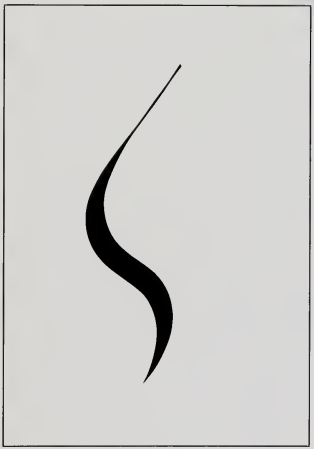


Figure 4

change one variable to experiment with creating a special effect and then change a second variable and so on. In this way the student learned what controls these effects just as a chemist might learn what controls the results of a test tube experiment. As the student changed one element at a time, he or she always kept in mind the overall expression and balance of the experiment because the result of the experiment always had to be a stimulating visual solution. In Figure 3 the number of lines was reduced to four, and they were varied dramatically in thickness in the sub-routines of this exercise so that combination, contrast, and rhythm of black and white spaces could be explored. There would be high marks if Peterhans did not have to change the solution too much in order to show what he called "a feeling for quality with spiritual discipline and a critical capacity."[7] When he did not change the solution at all, it was art and was held back for the permanent collection. There are probably about 500 such boards in IIT's collection.

The next group of exercises moved into three-dimensional problems. Figure 4 shows a student's response to the problem of describing a white board with a line that continuously changes direction and thickness. This line should define space on the board in unified volumes. The variations of this exercise were created through changes in the line's direction and movement. Elsewhere Peterhans required his students to describe the board with a series of curved planes that cross-connect to different points on two lines. There are five variations of this exercise that may be created by changes in the density of the network of lines, the structural forms of the parabolas, and the different tones of gray which intensify the planes. The results from this exercise are dynamic. They create expressions of movement, and often take on the lifelike qualities of dancers, dragons, and purely imaginary animals. In the Frontispiece to this article, the student has described the board with a series of planes cut from different colors of paper and through this description has made clear his understanding of many spatial relationships. Variations of this exercise may be created by changing the size, shapes, density, and relationships of spaces. To please Peterhans, one had to be able to feel the space between the planes with one's eyes and make the spaces the object of the composition. For years IIT students have carried this exercise one step further by moving freestanding walls around in a space contained by floor and roof slabs, and through these changes they have investigated first the aesthetic relationships and later the functional requirements of space.

The next exercises focused the student's attention on texture and color. In Figure 5 the student created a texture by repeating a brush stroke. The texture is held together by the structure between the strokes and by variations in spacing, sequence, light, dark, and density. A second series of this exercise required the student to use a special tool of choice to experiment with the same problems worked out in Figure 5. The plate in Figure 6 is a board composed on 12 differently colored textures that challenged the student to experiment with combinations of textures and colors to achieve complimentary relationships.

The final exercise and its series of sub-exercises led a student to experiment freely with abstract forms not fully under the student's control. In Figure 7 the student was required to place differently colored pigments on water and establish unforeseen relationships through the changes in form, color, and texture of the dropped elements. In this exercise one of Peterhans's goals was to show how important a role serendipity plays in the creative process.

Peterhans helped clarify the educational goals of the Visual Training exercises through readings, lectures, and films. Examples of readings were Rudolf Arnheim's chapters on balance and space in *Art and Visual Perception*, parts of a book about nonverbal communication by Jurgen Ruesch, large portions of Moholy-Nagy's *Vision in Motion*, selections from Wassily Kandinsky's *Point and Line to Plane*, two essays by Tomas Maldonado on *Max Bill*, and all of Paul Klee's *Pedagogical Sketchbook*, as well as an entire book of essays about Paul Klee called *Paul Klee on Modern Art*. Peter-

hans showed films with titles like "George Braque," "Jackson Pollock," "Oriental Brushwork," "Images from Debussy," and so on. In addition, Peterhans asked the student to write short critiques of other assigned books.

The Philosophical Basis of Visual Training

It is very unusual for a basic course in visual perception to outlast the man who created it by over a quarter of a century. The longevity of Visual Training is certainly a direct function of the design orthodoxy that has dominated IIT since Mies established the school. Indeed there may be no more conservative architectural school in the United States than IIT, and the school's adherence to Miesian architecture is carefully encouraged by the policy of hiring to the faculty large numbers of IIT graduates who have dutifully passed on Miesian approaches to architectural problems. All of the faculty took the same Visual Training course as students and find it easy to repeat as teachers since it has changed very little. Peterhans developed a perfectly clear set of visual training problems to be solved within a carefully prescribed set of conditions. The solutions required uncompromising technical skills and understanding. There has never been any need to change the problems, conditions, or the technical standards.

But Visual Training has survived also because it has a strong philosophical and methodological basis. Visual Training is founded on a platonic concept, reaffirmed by Kant, that beauty is grounded in the subject rather than the object, and that the task of education is to awaken the subject to his or her own insight. Kant's *Critique of Aesthetic Judgment* convinced Peterhans that beauty is a universal and eternal entity—not in the object but in the conceptual framework of the subject, in the human being who looks at the object. Nature has no laws of beauty. Instead these laws make up an internal apparatus that humans bring to seeing. Peterhans says in one of his later philosophical essays that "we evaluate the beauty of an object in nature according to whether or not it agrees with the harmonic order proposed to her, merely imagined, or executed as a work of art."[8]

From his familiarity with the philosophy of Kant it was easy for Peterhans to make the modern argument clear that beauty is not representational and cannot be produced by simply mimicking nature. Beauty emerges from what Peterhans called "a consummated unity" which human beings put into form and which human sensory systems can recognize and interpret. The key to beauty lies in the human's ability to recognize it within, and to organize it in the case of Visual Training on a 20" x 30" white board.

The second philosophical concern is how beauty is to be made recognizable. Peterhans addressed this problem through his understanding of Plato's concept of reminiscence as outlined in the *Meno*. Plato's *Meno*, a parable or myth, is still considered one of the great treatises on the nature of knowledge and on education. Peterhans used it frequently in his writings and in his lectures by substituting questions of beauty in place of the questions about virtue in the *Meno*. Both virtue and beauty are knowledge. The main question in the *Meno* is whether virtue can be taught. Plato suggests that virtue can be taught if properly broken down, so that the student recognizes it. This is true for beauty as well. Plato's thesis is that "all inquiring and learning is but recollection."[9] For Plato all knowledge is already in us at birth and merely needs to be recalled. Plato believed that all knowledge is in the soul, that the soul is immortal, and "having been born again many times, and having seen all things that exist, the soul has learned all things."[10] Plato also asserted that "there is no difficulty in eliciting, or as men say 'learning' out of a single recollection, all the rest, if a man is strenuous and does not faint."[11] Plato called the method for eliciting this knowledge the Socratic or dialectical method and based it on his view that if probing questions are asked again and again to break down the problems, the right answers will surely emerge from the student. In the *Meno*, Plato demonstrated this theory on a slave boy who solves a geometry problem under Socratic questioning even though the slave boy had obviously never studied geometry before. Plato never tells the slave boy the right answer to the geometry problem but merely awakens the

right answer through his Socratic methods. From this demonstration Plato concluded that the slave boy already had the knowledge because no one gave it to him. To use Aristotle's terminology, the slave already had the knowledge "potentially," and through proper questioning, the knowledge was evoked.

Plato's concept of recollection or reminiscence may, on the surface, seem rather farfetched or even naive by our twentieth-century standards, but it might also be interpreted as just another version of the long-standing argument about whether intelligence is a function of genetics or environment. Plato's version actually takes a middle ground on this question in that all possibility is within us as the beginning and only needs to be teased out of us through the environmental influence of a particular teaching method. In Visual Training the environmental influences include a 20" x 30" white board, questions which break beauty down into a learnable grammar, and the trained eye of someone who knows the grammar well.

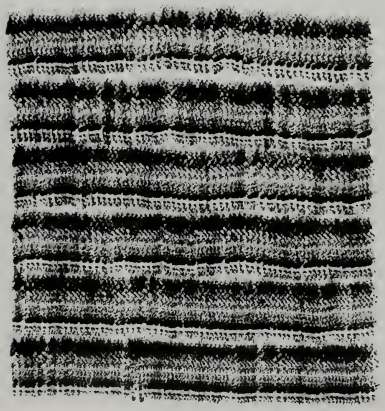


Figure 5

This became the position Walter Peterhans took as he considered Mies's request to develop a basic visual training course. In his essay "The Meno Maintained," Peterhans suggested that "the only proper thing to do is to develop our own power of insight and to discern our own thought and the thought of others by this, our own insight, by this our own cognition."[12] Peterhans goes on to ask:

"What does the theory of reminiscence imply? What does it mean to base a method of education upon it? It implies confidence in our own insight. It means, therefore, rationalism as opposed to skepticism and dogmatism. It implements criticism as a method of unfolding truth. In education its meaning is reinstatement of the love of insight, for intellectual independence, for self-knowledge. It means the impossibility of surrendering rational self-determination."[13]

Peterhans was the complete modernist who rejected the idea that beauty could be representational or "something historically established and hence *a posteriori*."[14] Instead,

beauty for Peterhans is a "symbol distinguished *a priori*, of that which is completely otherwise, of the eternal: unexpected transformation of the finite, threshold of the eternal."[15] For Peterhans the beautiful is in us and in recreating it we do not represent nature but "lay down the law for nature."[16] Through the Visual Training course Peterhans sought to help students discover these human laws which determine the beautiful through the Socratic method of asking the right questions and teasing out the right answers.

Visual Training: A Confluence of Science with Art

Walter Peterhans was always fascinated with technology and technique and as a child of a Zeiss engineer was at ease with science and its main tools of mathematics and logic. His father first taught him the science of the camera which in turn made art possible. This idea carried over into the Visual Training course. Peterhans believed that there could be no aesthetic judgment unless there was scientific knowledge first. After mastering technique and science of seeing, the student would be capable of deciding on content, but not before. In addition to a solid philosophical basis for Visual Training, Peterhans used a carefully developed method for students to discover the visual laws operating within them. This discovery process, worked out at the concrete level of the visual plate itself, was experimental in nature, and yielded a technically rigorous art. This empiricism fits Kant's view that the categories of knowledge are "fertile only when brought to bear on empirical data."[17] Peterhans did not approach the student with the usual high order abstractions, illusions, or metaphors we hear from most critics and teachers of art today. Rather he began with the concrete variables of two black lines on a white board. In experimental fashion he asked the student to hold one variable constant and change the other. Then change the first constant, and look at the effect on the first variable. This approach was not a metaphorical allusion to something the student could not know. It focused directly on the problem at hand, and used experimentation and observation as its operating principles. This scientific basis for

Figure 6

Figure 7

Visual Training made the course less susceptible to change and easier to teach generation after generation.

Conclusion

Visual Training is one of the longest, continuously operating basic design courses in the history of American architectural education. Its long life stems from its deep philosophical foundation, its obvious and logical methods, and its high technical standards. Visual Training has suited the Miesian aesthetic well, creating and reinforcing the strengths and weaknesses of an architecture that focuses on the artful expression of structure with machine-like precision. Perhaps the greatest criticism of Visual Training and the architecture which emerges from it is that nowhere in the course does the student have to confront the relationship between human beings and art. There are no exercises that teach the importance of human scale to architecture. Second, the isolation of visual problems from any practical context makes visual principles easier to teach but sometimes may make them difficult to apply later to architectural problems within the reality of practice. But in spite of these weaknesses, the strengths of Visual Training have paid off at IIT in a very recognizable architecture and educational identity.

Notes

1 Mies van der Rohe, Ludwig "Peterhans." Bauhaus Archiv (Berlin) 1967.

2 ibid.

3 Frampton, Kenneth *Modern Architecture, A Critical History* Oxford University Press (New York) 1980, p. 237. For a critique of the idea of Miesian disciples see Dirk Lohan, "Mies Re-Reconsidered" *Inland Architect*, November/December 1986, pp. 4-7.

4 Peterhans, Walter "Introduction to Visual Training" Unpublished manuscript.

5 ibid.

6 Mies van der Rohe, Ludwig "Peterhans"

7 Peterhans, Walter "Introduction to Visual Training"

8 Peterhans, Walter "On the Nature of Aesthetic Evaluation" Unpublished manuscript.

9 Plato *Meno* (translated by Benjamin Jowett) Bobbs-Merrill (Indianapolis) 1976, p. 37.

10 ibid.

11 ibid.

12 Peterhans, Walter "The Meno Maintained" Unpublished manuscript.

13 ibid.

14 Peterhans, Walter "Fragment on Aesthetics" *Ratio* Basil Blackwell (Oxford) 1961, p. 120.

15 ibid.

16 ibid.

17 *The Encyclopedia of Philosophy* (edited by Paul Edwards) Vol. 3, Collier Macmillian (New York) 1972, p. 312.8.

Collaging Spatial Ideas

Glenda Fravel Utsey
University of Oregon

A Tool for Teaching Spatial Inquiry

Teaching spatial inquiry is a challenge. First-year students have not developed visual skills generally, and two-dimensional drawing is not yet a liberating tool, for these students lack strong three-dimensional reference. How does one get on with the process of designing while still acquiring the tools?

At the onset of a project in first-year architecture studio a dilemma occurs: How do you convince students of the immediate need to investigate issues spatially? Most students are unwilling to suspend judgment and work intuitively with forms. If left to their own devices, students will collect data, make matrices, and gather all kinds of cognitive information before a line is drawn.

Students give convincing reasons why they cannot start designing: "I don't have enough information yet"; "I might end up with a scheme that won't work later on"; "It might be wrong"; and finally, "How do I know I'm making the right decisions?" The students' concerns are predictable upon review of their learning experiences before entering architecture school. Seldom have they used affective modes of inquiry for problem solving. Careful observation, reflection, and personal experience have been undervalued as resources for the examination and clarification of ideas.

Among the various media and tools that artists have used over the centuries, collage stands out as a technique which contributes to the understanding of abstract space. It is a tool that is easily adapted for investigating issues of composition and process. Collage provides a quick method of testing ideas and expressing experiences. It is a significant medium for exploration of objects in space.

History of Collage

To understand the function of collage in teaching architecture, it is necessary to examine past developments. Historically, the use of collage goes back many centuries. From the Americas we have examples of feather assemblage. Leatherworkers in Persia and later in Turkey excelled in making bookbindings from cutout pieces of leather. In twelfth-century Japan, calligraphers copied poems on carefully chosen pieces of paper and pasted them up. Paper cutouts were popular in Europe for greeting cards and silhouette portraits, and for centuries Chinese artists have cut complex patterns out of delicate, tissue-thin paper. In all the above examples, collage was used as a decorative art.

Upon the invention of photography and the revolutionary visions brought to the art world by Impressionistic painters, collage came to be more than decorative art. Seurat's vision, dissecting color and light to their smallest particles, and Cezanne's reduction of nature to its simplest forms led artists to investigate dynamic compositional space further.

Artists soon discovered collage was easily adapted to the investigation and abstraction of objects in space. It was now deliberately used as an analytical tool. Among the first

PEELING THE APPLE

analytical abstractions of dynamic compositions were Balla's vibrant stereographic paintings and Fotodynamic portraits by Bragaglia. Balla used collage to work out his ideas of movement and discovered that colored plates gave his work a vitality not possible with applied paint. Picasso, in his *Still Life with Fan, Salt Box, Melon* (1909) or in a later example, *The Man with the Book* (1913), took mundane objects and opened them to totally new interpretation. The picture plane became the primary organizer; it became the medium for the analysis of objects in space.[1]

Preoccupation with pieces and inventing new ways to transform and view them was not limited to artists. Musicians, writers, scientists, and philosophers were questioning traditional order. Technology began to offer views of the universe never before imagined. Einstein told the world that time was not absolute even though it was perceived as such. Scientists became poets and poets rewrote their verse reflecting on these complex new thoughts.

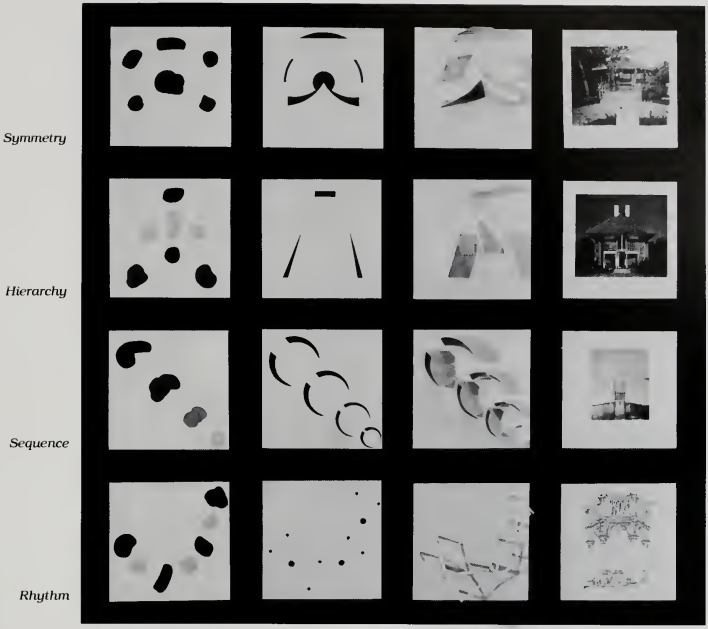
At the forefront of the Modern movement in architecture were young European architects who were aligning themselves with the Constructivist movement in Russia and the de Stijl group in the Netherlands. Intrigued by Cubists' experiments and new advances made in technology, they were eagerly incorporating these modern ideas and materials in their work.

In Russia, the tragic consequences of a world war and the overthrow of the Tsarist government in 1917 marked the beginning of the Constructivist movement. Lenin's reconstruction program was attracting architects who were members of the new intellectual community. Anxious to disinherit the opulent, Beaux-Arts past associated with the Tsarist reign, these architects were eager to design modern buildings for a perceived rational, utopian future. Like Cubists' art during this period, Constructivists' designs were of a genre well-suited to collage. Their buildings were composed of pieces, some whole and others parts of recognizable shapes arranged into balanced, dynamic abstractions.

At the same time, in the Netherlands, architects and artists of the de Stijl group were advocating the use of simple forms. Their designs suggested the collaging of rectangles and cubes into controlled, carefully balanced compositions. Buildings by de Stijl architects were characterized by distinct horizontal planes boldly marked by contrasting lines and planes of different values or primary colors. The Cafe de Unie in Rotterdam (1924-25), designed by Jacobus Oud, illustrates the bold attention given to the interplay of planes, punctured with windows, and doors and, finally, integrating graphics to balance and finish the composition.

During the 1920s, the Modern movement was gaining momentum in Europe. The German design school, Weimar Bauhaus, was establishing a reputation as a center for education of modern designers. The learning environment at the Bauhaus marked a significant break from the staid and elitist Ecole des Beaux-Arts: "At Weimar, and in the early years at Dessau, this was essentially an artist's vision; for a brief period the theories of the Expressionists, then those of the Constructivists, influenced the choice of forms and materials for . . . design."[2] These Modernist teachers, under the directorship of Walter Gropius, opened new avenues to problem solving, encouraging students to take responsibility for their own education with emphasis on learning from doing: forming conclusions from observation and experience. Their rebellion helped to bring architecture into the Industrial Age. The program at the Bauhaus flourished, eventually attracting teachers and students from all over Europe and the world.

At the Bauhaus, many exercises were developed for the introductory design curriculum using collage to investigate composition, elements of form, compatibility of materials, color relationships, manipulation of voids, solids, and depth of field within frames of reference. Among the instructors using collage and assemblage in teaching introductory design was Laszlo Moholy-Nagy, a Hungarian who joined the Bauhaus staff in 1923. He quickly became influential: ". . . It was above all Moholy-Nagy's personal interpreta-



FOURTEEN STONES, Spatial Elements Problem

tion of Constructivist attitudes that contributed to the emergence of a recognizable Bauhaus style."[3] Moholy-Nagy instructed students in exploring spatial relationships using various materials, particularly glass and metal. He shared his interest in manipulating spatial transparencies by designing exercises where students made assemblages by collaging together pieces of glass of various colors, shapes, and transparencies. Moholy-Nagy was defining space, at this time, as the "interweaving of shapes; shapes which are ordered into certain well-defined, if invisible, space relationships; shapes which represent the fluctuating play of tensions and forces."[4]

Unfortunately, it was becoming increasingly difficult to teach at Weimar, where the local Fascists were emerging as a strong political force. No longer willing to put up with political oppression, the Weimar Bauhaus faculty voted to move the school to the more progressive city of Dessau where, in 1925-26, Gropius designed and supervised the construction of the new school. Immediately upon its completion, the Dessau Bauhaus building was recognized as an important product of the Modern movement.

The same year, Mies van der Rohe had been put in charge of organizing the Second

Werkbund Exhibition (also referred to as the Weissenhof Housing Exhibition) in Stuttgart (1927). It gained world-wide attention for the young European architects exhibiting their Modernist buildings. Among the architects with buildings at the exhibition were Mies van der Rohe, Walter Gropius, Le Corbusier, Bruno Taut, Peter Behrens, and Jacobus Oud, all of whom were going to have profound influence on the education of the next three generations of architects in Europe and America.

In 1938, the Dessau Bauhaus was closed by the Nazi government. By then most of the Bauhaus faculty had left Germany to join prestigious universities elsewhere in Europe and America. Some attempted to start new schools. But, the sobering influence of the Second World War and an inability to recreate the subtle chemistry that flowed between students and faculty at the Bauhaus meant the unique learning environment has never been duplicated.

FOURTEEN STONES, Studies of Compositions

Written accounts and illustrations of work by participants describe the Bauhaus faculty as a group sharing an intense interest in creating a new ideology for teaching spatial inquiry. Although the faculty did not always agree with each other's methods, there was an agreed-upon goal. Upon the departure of Gropius and Moholy-Nagy in the spring of 1928, Josef Albers took over the introductory design course. Describing the course in "Werklicher Formunterricht,"[5] Josef Albers writes: "Through discussion of the results obtained from the study of the problems of materials, we acquire exact observation and new vision. We learn which formal qualities are important today: harmony or balance, free or measured rhythm, geometric proportion, symmetry or asymmetry, central or peripheral emphasis."[6]

Howard Dearstyne, an American, writes of his experience at the Bauhaus in 1928: "Albers was my first teacher. . . . To me fresh out of Columbia's School of Architecture, he was an exciting influence. He didn't require us to draw in minute detail the five orders of architecture; they were never so much as mentioned in his class. He didn't set us

copying, in charcoal, plaster reproductions of classic sculpture, possibly because the Bauhaus boasted none of these; he didn't have us make elaborate watercolor renderings of grandiose and painfully symmetrical imitations of French and Italian Renaissance buildings, he didn't ask us to digest the writings of Vitruvius, Vignola, or Palladio; in fact, he emphasized the uselessness of reading anything (except possibly his own articles). What Albers did was to seat us at long tables in the workshop wing of the Bauhaus and confront us with some unlikely materials such as wire, wire mesh, paper, corrugated cardboard, sheet metal, match boxes, newspapers, or whatnot. We were supposed to do something with these—just *basteln*, or play around with them to see if we could make something out of them or discover something about them."[7]

Those of us teaching in the 1980s can look back with some insight and see the failings as well as the successes of the Bauhaus. But, no doubt the most valuable contribution of the Bauhaus had been in freeing design education from narrow and confining philosophy of traditional Beaux-Arts schools. The Bauhaus's emphasis on synthesizing, experimenting, and observing as essential to process and skill development has profoundly changed the scope of design education. Its teaching has given today's designers insight into the complexity and multiplicity of issues.

The legacy left by the Bauhaus has liberalized our definition of good architecture, broadening today's understanding to take into account the origin, style, period, and function. We have learned that all good architecture shares similar attributes. The properties inherent in good architecture suggest wholistic understanding and complete and recognizable order: the order has simplicity which is empathetic to the users and embraces and responds to the complexities of place; there is clarity in the use of materials and configuration of spatial elements, symmetry, hierarchy, sequence, and rhythm; and finally, every good building has clarity of purpose, conscious celebration of and attention given to human needs and proportions.

Collage as a Tool for Teaching Spatial Inquiry

Teaching students to develop an awareness of the multiplicity of issues is the task of the beginning studio teacher. Generally these students share a misconception that architecture is limited to the making of buildings as artful objects. Many have had drafting classes and most have seen professional publications which give the impression that the context and users are neither necessary or important.

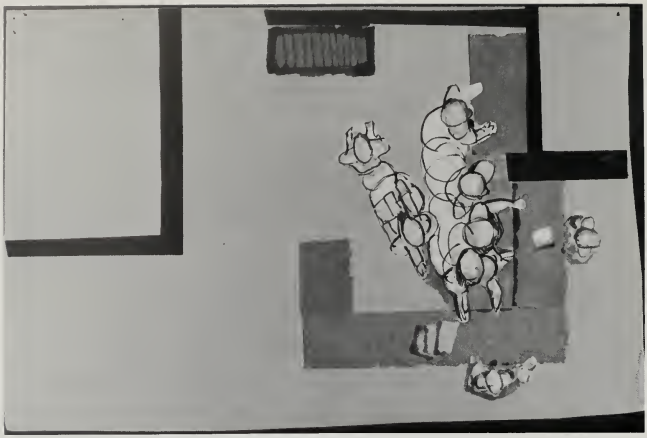
I have found collage to be a useful tool for teaching beginning students about complex issues. Collage enables students to look at the whole, seeing objects as part of larger compositions, allowing abstraction of forms and promoting criticism of the whole rather than of pieces. They can focus on the essence of their ideas. The beginning synthesis of issues can be translated quickly into images that can be tested, explained, and studied.

For beginning students yet unskilled at analytical drawing and descriptive geometry, drawing tends to be a static medium. Collage may be manipulated more readily as Matisse demonstrated when he first used cutouts to solve a difficult geometric problem. Commissioned to decorate the vaulted ceiling of Albert C. Barnes's private museum in Merion, Pennsylvania, Matisse used paper cutouts to visualize the ceiling's complex curves in order to fit painted figures he designed.[8] A facile tool such as collaging can thus be an effective medium for spatial inquiry. It also proved to be a useful tool for early Cubists who wanted to assemble and test figure/field relationships quickly.

Collaging is an unselfconscious medium, less personal than drawing. Beginning students share a similar skill level for making collages, and they are not embarrassed to pin up their work. Simply put, anyone can cut and paste. With this in mind, I developed four exercises using collage as a tool for visual inquiry.

Exercise 1: Fourteen Stones

As I discussed earlier in this paper, Cubists used collage to compose the picture plane, to clarify and simplify complex ideas. Students



Collaging human activity at a schematic library counter

learn to do the same with the Zen "game," Fourteen Stones.

For this activity, each student brings to class seven stones, carefully chosen, and a sheet of white paper. Each teams up with a partner, taking turns placing stones on the paper 'field' until all fourteen stones have been placed. The teams then reverse the process, removing the stones. The exercise is introduced with minimal verbal instructions, and one team begins while the rest of the class observes. It is not long before the observing students start to express agreement or disagreement with the placement of stones.

After the students have had a chance to play Fourteen Stones with different partners, they are instructed to make a series of spatial investigations alone. Each student must describe symmetry, hierarchy, sequence, and rhythm by arranging their seven stones on four corresponding 6"x6" sheets of white paper. The students then substitute black cutouts to represent each stone, and gray when stones are placed on top of one another. At this point, each student is asked to look carefully at size, weight, and implied forms generated by the placement of stones.

On another four base sheets, each student translates his rock compositions into linear compositions. Using varying widths and lengths of black or gray strips of paper he must represent the stone compositions as they appear upon the four original additive base sheets. Finally, the four line compositions are interpreted using colored paper with careful attention given to hue, value, and intensity.

At the next class meeting, we discuss each student's twelve base sheets which he or she has now mounted on a large black board. We take this opportunity to look at slides and discuss examples of symmetry, hierarchy, sequence, and rhythm in built places.

For the next class meeting, each student builds four models interpreting each of the colored line compositions. The students are also instructed to find pictures of built spaces that best reflect their rock, line, and modeled

compositions of the four spatial elements: symmetry, hierarchy, sequence, and rhythm. Each student continues using the same format, ending up with a total of twenty 6"x6" base sheets, mounted in order, on a large black board.

The goal of the exercise is to introduce compositional issues which are dependent on, and influenced by, a defined field. The participants are surprised to find that decisions governing the placement of the stones are highly complex. No one is willing to put down a stone at random. As the project is taken through its various phases, the students begin to identify the components which govern spatial composition. Focusing on the specific elements of symmetry, hierarchy, sequence, and rhythm introduces students to spatial vocabulary. Asking them to go to the library and find examples of places which best represent these elements tests their understanding and exposes them to precedent.

Another version of the exercise requires students to keep track of their additive compositions on seven base sheets. They are asked to translate the final composition onto a new base sheet using varying widths and lengths of black strips of paper. Finally, they build a model of their linear interpretations. The model must be black and designed to be viewed from any direction. This variation of the Fourteen Stone game more closely resembles exercises given at the Bauhaus. The spatial vocabulary is less specific and does not require students to look at precedent.

Exercise 2: Collage as an Empathetic Tool

At about the time Cubists were experimenting with dynamic space on their canvases and Bauhaus faculty were educating a new generation of modern architects, Walt Disney was pioneering the development of action-filled cartoons. Collaging thousands of separate transparencies into split-second movements, Disney was creating a world rich in fantasy. Later, in the 1950s, he pulled fantasy out of an observational mode into real-life action modes by taking these storybook places and collaging them onto real landscapes. Disney was designing and crafting nostalgic and futuristic places into the theme park, Disneyland, to house bigger-than-life cartoon characters and provide a make-believe world for families to enjoy.

For fine artists working in the early 1960s and 1970s, Disney's work did not go unnoticed. Partly as criticism of a perceived "kitchness" in popular imagery and a joke on the mass imagery being seen on daily television, artists were using collage to build "fixed-framed," real-life settings such as Segal's *Butcher Shop*, or Dine's carefully patterned assemblages of everyday objects.

Architects were beginning to notice what artists were saying and people were demonstrating: people enjoyed visiting theme parks, eating at McDonald's, and driving their cars to the suburbs to do their shopping in covered malls. Venturi took academics to Las Vegas and told them to study common places and find beauty in their vitality. Architects began looking more carefully at people's everyday activities and noticing how and why they used places.

At that time, sociology was becoming a topic of great interest to architects; and sociologists were becoming interested in architecture. Public places, such as the Lovejoy and Forecourt Fountains in Portland, were being designed as places for people to gather and play; marketplaces were being revitalized with cafes and small specialty shops; monolithic public housing was being challenged and scaled down into recognizable neighborhoods. Careful follow-up studies were being made of people interacting with their newly built environments.

The architect's vision was no longer limited to Oscar Schlemmer's *Man in Space* [9] or Le Corbusier's rational, utopian Modular Man.[10] Rudofsky's *Streets for People*, Sommer's *Personal Space*, Bloomer and Moore's *Body, Memory, and Architecture*, and Alexander's *Pattern Language* were being read by a new generation of architects.

Exercise 3: Self Measure

Architects design places for people. We are people, therefore we can learn from observing

day-to-day experiences and using an empathetic frame of reference. Tools are necessary for assessing behavioral and physical needs of people.

Self Measure is an exercise for beginning students which introduces scale references and becomes a tool for later use. Students are assigned to teams and told to trace a team member's body, dimension it, then make it graphically beautiful. The body tracings are often made into outrageous and funny caricatures. In their notebooks students are to record their personal pacing stride length and hand spread. Next, the students organize themselves and mark off and dimension the studio space. The body tracings and room dimensions are used as scale references during the term. Self Measure is given at the first class meeting and works as an "ice-breaker."

An exercise using collage can also help students to understand human activity needs. This exercise calls for the development of activity scenarios. Each student is asked to make a 1/2" = 1'0" scale plan and section of a specified space. Next, they collage onto the plan and elevation figures of people performing various activities assigned to the space.

Exercise 4: Peeling the Apple

Design should be an orderly process. It requires cognitive and affective learning modes to analyze and synthesize ideas. The first-year student needs to learn to identify and define the problem (analyze); to organize the information and the process necessary for effectively solving the problem (synthesize); and to develop media skills necessary to explain the solutions and initiate critical discussion.

Seldom are students privy to design processes used by professionals. Only a few books are available that chronicle architects' methodologies. The most descriptive and thorough chronicle is Alexander's *Oregon Experiment*; to a lesser extent, *The Place of Houses*, by Moore, Allen, and Lyndon; *Towards a New Architecture*, Modular series and monographs published during the 1920s and 1930s by Le Corbusier and colleagues; and the classic treatise, *De Architectura*, by Vitruvius.

Peeling the Apple is an exercise designed to stimulate the development of process, content, observational, and media skills. It is with this exercise that the students are first introduced to a conceptual model and Robert S. Harris's *Model for Designers*.

Each student brings an apple to class. The class then forms groups of three. Each group records everything its members know about their apples. The class regroups, and, as a representative of each group reports on the collected knowledge, the data are recorded on a blackboard under these basic categories from *Model for Designers*: Perceptual, Operational, Political, Economical, Societal, and Environmental "Frames of Reference." The students quickly realize that their knowledge of the apple is very complex and that the apple is more than an edible piece of fruit.

Next, the students are asked to build a conceptual model that represents all the categories discussed and describes their apple's internal and external form. They are to use only white and/or cream-colored paper. Limiting the color helps the students focus on form. The assemblage is reviewed at the next class meeting.

The final step in Peeling the Apple requires each student to record his or her mental and physical processes used in planning and building the apple model. Each student communicates the information on a 20"x30" board using mostly visual means. The process boards are reviewed during the next class meeting. We spent time examining their modes of thinking, tools used, time factors, and how a methodology might improve the process.

Exercise 5: Conceptual Model

Television has been a "swift montage"[11] of visual imagery from which "whole societies have learned to experience the world vicariously, in terms of swift montage and juxtaposition. . . . Ours is the cult of the electronic fragment."[12] The children's television show "Sesame Street" has a format that gives its

Collaging a schematic design for a Meditation Garden

viewers quick, succinct collages of ideas and information. Music videos and commercials rely heavily on "swift montage." Advertising philosophy indicates that these short films must be to the point, get a maximum amount of information across in a few seconds, and clearly present the essence of the idea.

The Conceptual Model exercise has proven to be an excellent means for getting at the spatial essence of a place, and the format encourages the 'swift montaging' of observations and feelings.

For this exercise each student visits the site and makes written and visual sketches in a notebook using *Model for Designers* as a guide.

After the initial site visit, the student is asked to conceptualize the site, using only paper on a cardboard base, representing what each has seen, heard, smelled, felt, and possibly tasted. Using colored papers, the student represents observations by cutting, tearing, folding, crumpling, pasting, etc. The phenomenon each describes is based on personal interpretation. The model is a personal rendition of experience. The process must be quick. Students complete their models for discussion at the next class meeting, and we review them using a sensory framework:

Sight– color (hue, intensity), lightness, darkness (shade, shadow), sunlight, layering of materials, direction, size, proportion, shape, scale relationships, openness, containment, enclosure, line, edge, use patterns, movement, beauty, ugliness; clean, dirty, etc.

Tactile– rough, smooth, soft, hard, dry, wet, sticky, warm, hot, cold, windy, still; layering of materials and activities.

Sound– loud, quiet, continuous, melodic, rhythmic, or uncomfortable; patterns of sound, movement through site, indicators of time, etc.

Smell/Taste– sweet, bitter, chemical, polluted, healthy, unhealthy; source of smells/tastes, etc.

The Conceptual Model is a mode through which students can express personal experiences and sensitivities. Because it is personal, it cannot be wrong, but students discover universally shared understandings and some disagreements. The model enhances shared observations, is a creative medium for discussion, and acts as a bridge toward the collection of more factual information. The expectation is that the students learn, through personal interaction and visual reporting, to observe the phenomena that make places. They sensitize and maximize the capacity for observing, interpreting, visualizing and, then, recreating spatial concepts.

The collage/assemblage assignments are not meant to be belabored. They should be quickly executed to encourage succinct and rapid visual thinking and production.

The philosopher Alfred North Whitehead writes: "The misconception which has haunted philosophic literature throughout the centuries is the notion of independent existence. There is no such mode of existence. Every entity is only understood in terms of the way in which it is interwoven with the rest of the universe."[13] For Picasso and Braque, the interdependence of objects meant they could go no further with paintings, but needed to include, or weave in, found objects from the real world. Collage provided the means by which the pasted-up, found objects could become direct links to everyday experience. The Cubists' collages were unique, pragmatic interpretations of form. Their analysis of figure/field relationships were masterful.

Collaging, as a means of conceptualizing spatial ideas, is a tool applicable to investigating projects at a regional scale or as small as a single room. It promotes the rapid investigation of figure/field relationships. The designer is accountable for the whole context. The design footprint is visualized as an integral part of the field.

For advanced students, collaging multiple schemes within a context provides a useful introduction to a project. Collage can be used to test compositions of facades, interior elevations, or activity settings. It lets the designer play with proportion while reducing detail to a large format of suggested complexity. Painterly care can be given to composition. Elements can be freely overlapped, offset, and balanced with bold use of form, texture, material, and color.

Collage is a dynamic medium. It can be ripped apart and reglued. Pieces can easily be moved around the field; they can be given thickness, texture, color, and represent plan, section, or perspective viewpoints. Collage is a valuable analytical tool that promotes the abstraction of the whole, the inside and outside. No space is left over, all is significant.

Notes

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2 Naylor, Gillian *The Bauhaus* Studio Vista/Dutton (London) 1968, p. 109.

3 ibid.

4 ibid., p. 101.

5 Bayer, Herbert; Gropius, Walter; and Gropius, Ise *Bauhaus 1919-1928* Museum of Modern Art (New York) 1975, p. 118 (originally from "Werklicher Formunterricht", published in Bibl. No. 30, 1928, Nos. 2-3).

6 ibid.

7 Dearstyne, Howard *Inside the Bauhaus* (edited by David Spaeth) Rizzoli (New York) 1986, p. 90.

8 Wescher, Herta *Collage* (translated by Robert Wolf) Harry N. Abrams (New York) 1968, p. 303.

9 Naylor, see pp. 161-67.

10 *Le Corbusier Selected Drawings* (introduction by Michael Graves) Rizzoli (New York) 1981, p. 39; also see drawing no. 25217, Unité d'Habitation.

11 Hughes, see pp. 344-47.

12 ibid., p. 345.

13 ibid., p. 32.

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Architecture and Landscape as Synonymous Experience

Robert J. Fakelmann
Louisiana Tech University

The garden evolved as a structured landscape to offset the rigors of 18th-century industrialization: it offered a means to encounter nature, a place to forget, and a place to experience the "romantic." In the garden, an evocative human event is experienced through the ritual of movement, regarded here as the promenade.

In traditional attitudes toward design, the building is regarded as an object, an entity separate from the landscape. It is seldom seen as a mixture of architecture, landscape, and human event. As an alternative, a design scheme could seek to integrate these three. Its purpose would be twofold: first, to formulate a set of relationships between the elements of architecture and those of the landscape in an interacting compositional scheme; and second, to orchestrate the movement through which the experience of these relationships is encountered.

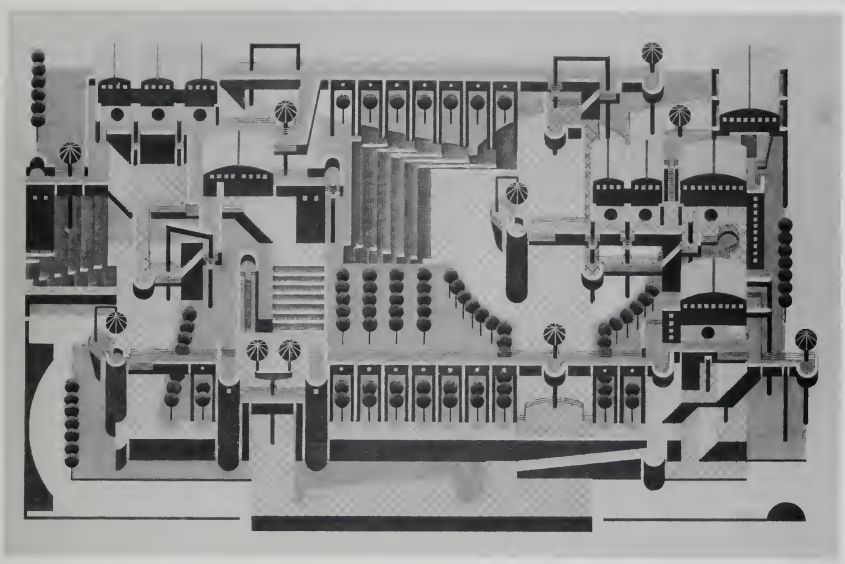
Among the different ways the landscape is perceived, it can be perceived as a whole, a single homogeneous entity. The notion of "The Landscape" certainly suggests an entity that is complete or unitary. If, however, the landscape were to be considered as a heterogeneous entity, it could then be perceived as a series of collective parts (e.g. tree, mountain, hill).

Architecture, too, can be perceived as a heterogeneous entity consisting of parts or elements which together create a unified whole (e.g. wall, floor, column, aperture). The built landscape (specifically the city) can be seen as a constructed landscape of which its architecture is a part. Since architecture, seen as a series of elements, is a part of the built landscape, the built landscape can then be considered as an entity composed of heterogeneous parts.

If the natural landscape and the built landscape were to be regarded as two separate but *homogeneous* entities, they would mutually preclude interaction: each is a distinct whole, having a completeness of its own, specific to its nature. If the two were to be regarded as separate but *heterogeneous* collective entities (set of parts), the possibilities for interaction exist.

Architecture and the landscape are regarded here as a series of individual parts of elements which, through a single interacting composition, create a unified whole, establishing what is referred to as a field for an environment.

The design schemes (see figures) represent a compositional field which is organized into various levels to allow for a range of vistas both inward and outward. Spatial distinction is articulated by walls (extensions of the buildings into the landscape) and by repetition of architectural and natural elements. Apertures in the walls acknowledge the merging of these elements and allow them to be experienced as one. The elements of architecture together with those of the landscape are treated as one indivisible entity, illustrated through a set of structured relationships.



A set of structured relationships can be defined as the composed associations between objects (forms) or places which are perceived by an individual as he moves through space. If the experience encountered by the perception of these relationships is in some way recognizable, the individual may apply a particular meaning to that experience. The applied meaning, of course, can be seen as being relative to the individual and is therefore unique, a characteristic of individuality. This uniqueness of meaning can create an experience that appears to be outside what is normally encountered everyday. The subtle occurrences that alter the structured routine of the day can become most memorable or, as so frequently described, "eventful." Thus, a meaningful act is described here as an "event."

For a phenomenon to be an event its uniqueness does not have to be related to what is all too often described as "original work" or, put in another way, that which has no prior conception. It is rather an experience that can refresh the emotions and liven the senses, removing our conscious thoughts from the routines that structure our daily lives. From this perception the experience of romanticism gives meaning to the structure of the relationships between the elements of architecture and those of the landscape.

Romanticism can affect one's desires and emotions. Man's appetite for romanticism lies, in part, in the desire to experience ideas, events, and places that are seen as having greater significance than himself. Why else would numbers of people each year visit the great castles of Germany, climb the Acropolis at Athens, or ascend the campaniles of Italy? They are looking for "the sublime," the grandiose, the fanciful, the romantic, or something outside the everyday.[1] Aside from the different meanings associated with these places, it can be suggested that because of

the "High Place" relationship they have to the landscape, they allow one to experience the poetic. As special works of architecture they propose an effect on the human mind by providing an awareness not only of the greatness of the past, but also of the present. Just as the "High Place" in nature can make one aware of the vastness and greatness of the natural landscape, the "High Place" in the built environment can provide an awareness of the phenomenal relationships existing within the places in which we dwell. This awareness, whether experienced as an obvious or subtle phenomenon, is regarded here as romanticism. Romanticism as an experience can give meaning to the places in which we dwell. It is as an element of appeal (whether an obvious or subtle phenomenon) that when perceived can attract one to a particular place and, further, give reason to return. It is the event of returning, an act of individual choice, that becomes ritual through its repetition. If architecture can propose an effect on the human mind and is not merely a service to the human frame, ritual may be said to be the poetics of function.[2] Insofar as a building is shaped by ritual, a repetitive human event, it does not simply house function, it comments on it! Ritual gives a building purpose; it is the transcendence of function to a meaningful act.[3]

The orchestration of movement is a primary consideration in the organization of the design schemes. It is through movement that one can experience the romantic and realize the relationships existing between the elements of architecture and those of the landscape. If romanticism can give meaning to the places in which we dwell and ritual is held to be the transcendence of function to a meaningful act, then it is here where the function of movement becomes a meaningful act, and through the promenade, the relationships between architecture and the landscape comment on their purpose. Movement enables one to recall the romantic notion of promenading through the landscape and to experience the composition as a whole while investigating its many parts.

In the design schemes the ritual of movement (the promenade) is shaped to accommodate elements seen as being romantic. Towers reflect subtle notions of the "High Place" and can represent such things as command and security. They gain further significance because they terminate movement and allow one to sense one's position within the compositional field. Circular elements at various levels in the sequence of movement serve as belvederes by providing vantage points where one can pause and gain a sense of pictoriality (the design notion of the 18th-century English gardens which were structured primarily for views). Wall surfaces become scenery in which the relationships between architecture and the landscape are revealed. Building forms and elements, rather than being regarded as objects (entities separate from the landscape), are seen as integral to the compositional fabric of which the landscape is part.

Romanticism as an experience gives meaning to the event of movement, establishing the ritual of the promenade. This movement within the design scheme allows the participant to perceive the merging of architectural and natural elements into one. From this perception architecture and landscape become synonymous.

Notes

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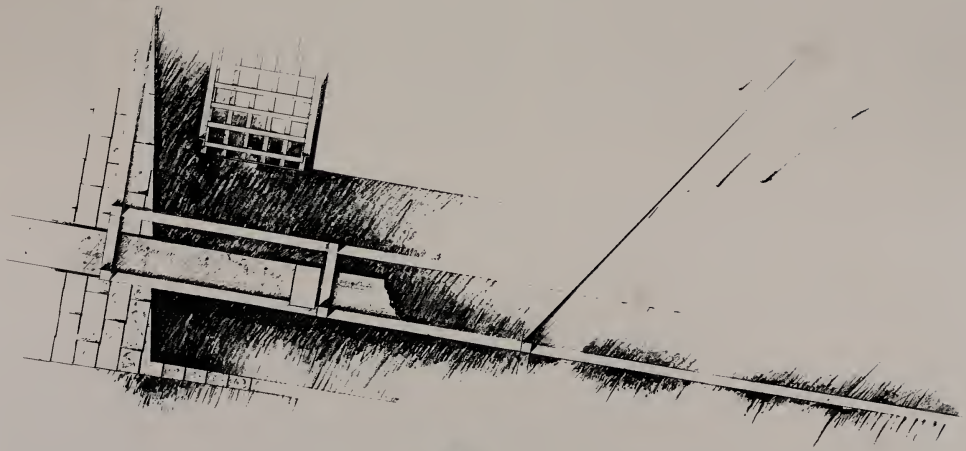

Ryoji Suzuki

The Pecksniff Paradigm: Erudition and Scholarship in Architectural Education

Peter Schneider
Louisiana Tech University

It is with questionable privilege and dubious honor that I introduce to you Mr. Seth Pecksniff. Mr. Pecksniff is, rather unfortunately for his sake and even more so for our sakes, one of the central characters in Charles Dickens's novel *The Life and Adventures of Martin Chuzzlewit*. Chuzzlewit was initially published in 1843 and 1844. It tells the sad and sorry tale of the education, life, and times of a fledgling architect, Martin Chuzzlewit.

Let me use Charles Dickens's words to present both Pecksniff and Martin Chuzzlewit, and to paint a troublesome but apparently accurate picture of the state of architectural education in early nineteenth-century England. That picture, bleak as it is, is perhaps a poignant parable for architectural education and architectural practice in their current, postmodern predicament. And parables, as you know, are not to be explained, analyzed, or elucidated, but exist merely to be experienced as metaphors which prick our conscience and reinforce our ethic and morality. Dickens's pointed parable begins:[1]

"It has been remarked that Pecksniff was a moral man. So he was. Pecksniff was a moral man, a grave man, a man of noble sentiments and speech. Perhaps there never was a more moral man than Pecksniff; especially in his conversation and correspondence. He was a most exemplary man, fuller of virtuous precept than a copy book. His every aspect tended to the same purpose, and cried aloud 'Behold, the moral Pecksniff—the architect, artist and man.' For Pecksniff was, you see, an architect. The brazen plate upon the door (which, being Pecksniff's, could not lie) bore this inscription, 'PECKSNIFF, ARCHITECT,' to which Pecksniff, on his cards of business added, 'AND LAND SURVEYOR.' In one sense, and only one, he may be said to have been a Land Surveyor on a pretty large scale, as an extensive prospect lay stretched out before the windows of his house. Of his architectural doings, nothing was clearly known, except that he had never designed or built anything; but it was generally understood that his knowledge of the science was almost awful in its profundity.[2]

"Pecksniff's professional engagements, indeed, were almost, if not entirely, confined to the reception of pupils. His genius lay in ensnaring parents and guardians, and pocketing premiums. A young gentleman's premium being paid, and the young gentleman come to Pecksniff's house, Pecksniff borrowed his case of mathematical instruments (if silver-mounted or otherwise valuable); entreated him, from that moment, to consider himself one of the family; complimented him highly on his parents or guardians, as the case might be; and turned him loose in a spacious room on the two-pair front, where, in the company of certain drawing-boards, parallel rulers, very stiff-legged compasses, and two, or perhaps three, other young gentlemen, he improved himself, for three or five years, according to his articles, in making elevations of Salisbury Cathedral from every possible point of sight; and in constructing in the air a vast quantity of Castles, Houses of Parliament, and other Public Buildings."

And now we first hear of the unfortunate Martin Chuzzlewit, who enters the fray as

Pecksniff, more than slightly hung over but nevertheless a highly moral man, talks with his daughters after a rather ignominious episode.

" 'Yes,' said Pecksniff, after a short pause, during which he had been silently smiling, and shaking his head at the fire, 'I have again been fortunate in the attainment of my object. A new inmate will very shortly come among us.' 'A youth, Papa?' asked Charity, the younger daughter. 'Ye-es, a youth,' said Pecksniff. 'He will avail himself of the eligible opportunity which now offers for uniting the advantages of the best practical architectural education with the comforts of home and the constant association with some who (however humble their sphere, and limited their capacity) are not unmindful of their moral responsibilities.' 'Is he handsome, papa?' inquired Charity? 'What is the premium?' says Mercy, the older daughter."

Clearly a moral family, implies Dickens, as he with so few words develops the characters of the sisters Pecksniff.

Martin arrives, after a pregnant interval and many conjectures, and Pecksniff—after welcoming him into the family and exposing him to the delights of the simpering sisters grim —takes him in hand to introduce him to the scenes of Pecksniff's architectural aspirations and fantasies.

" 'Come,' says Pecksniff. 'This,' opening a door,'is the little chamber in which my works (slight things at best) have been concocted. Portrait of myself by Spiller. Bust by Spoker. The latter is considered a good likeness.' Martin thought it was very like, but scarcely intellectual enough. Pecksniff observed that the same fault had been found with it before, and remarked that he was glad to see Martin had an eye for art.

"'Various books, you observe,' said Pecksniff, waving his hand towards the wall, 'connected with our pursuit. I have scribbled myself, but have not yet published. Be careful how you come up stairs. This,' opening another door, 'is my chamber. I read here when the family suppose I have retired to rest. Sometimes I injure my health, rather more than I can quite justify to myself, by doing so; but art is long and time is short.'

"With that he led to the floor above. 'This,' said Pecksniff, throwing wide the door of the memorable two-pair front 'is a room where some talent has been developed, I believe. This is a room in which an idea for a steeple occurred to me that I may one day give to the world. You see,' said Pecksniff, passing the candle rapidly from roll to roll of paper, 'some traces of our doings here. Salisbury Cathedral from the north. From the south. From the east. From the west. From the south-east. From the nor'-west. A bridge. An almshouse. A jail. A church. A powder-magazine. A wine-cellar. A portico. A summer-house. An ice-house. Plans, elevations, sections, every kind of thing.' It was the finishing ornament of the conversation; for when he had delivered it, Pecksniff rose, and led the way to that hot bed of architectural genius, the two-pair front. 'Let me see,' he said, searching among the papers, 'how you can best employ yourself, Martin, while I am absent. Suppose you were to give me your idea of a monument to a Lord Mayor of London; or a tomb for a sheriff; or a notion of a cow-house to be erected in a nobleman's park. Do you know, now,' said Pecksniff, folding his hands, and looking at his young relation with an air of pensive interest,'that I should very much like to see your notion of a cow-house?' But Martin by no means appeared to relish this idea. 'A pump,' said Pecksniff, 'is very chaste practice. I have found that a lamp-post is calculated to refine the mind and give it a classical tendency. An ornamental turnpike has a remarkable effect upon the imagination. What do you say to beginning with an ornamental turnpike?' 'Whatever Mister Pecksniff pleases,' said Martin, doubtfully.

"'Stay,' said that gentleman. 'Come, as you're ambitious, and are a very neat draughtsman, you shall— ha, ha— you shall try your hand on these proposals for a grammar-school; regulating your plan, of course, by the printed particulars. Upon my word, no,' said Pecksniff merrily, 'I shall be very curious to see what you make of your grammar-school. Who knows but a young man of your taste

might hit upon something, impracticable and unlikely in itself, but which I could put into shape? For it really is, my dear Martin, it really is in the finishing touches alone, that great experience and long study in these matters tell. Ha, ha, ha! Now it really will be,' continued Pecksniff, clapping his young friend on the back in his droll humor, 'an amusement to me to see what you make of the grammar-school.'

"Martin readily undertook this task, and Pecksniff forthwith proceeded to entrust him with the materials necessary for its execution, dwelling meanwhile on the magical effect of a few finishing touches from the hand of the master; which, indeed, as some people said (and these were the old enemies again!) was unquestionably very surprising, and almost miraculous; as there were cases on record in which the masterly introduction of an additional back window, or a kitchen door, or a half dozen steps, or even a water spout, had made the design of a pupil Pecksniff's own work, and had brought substantial rewards into that gentleman's pocket. But such is the magic of genius, which changes all it handles into gold. 'When your mind requires to be refreshed, by change of occupation,' said Pecksniff, 'Thomas Pinch will instruct you in the art of surveying the back garden, or in ascertaining the dead level of the road between this house and the finger-post, or in any other practical and pleasing pursuit. There are a cart-load of loose bricks, and a score or two of old flower-pots, in the back-yard. If you could pile them up, my dear Martin, into any form which would remind me on my return— say of St. Peter's at Rome, or the Mosque of St. Sophia at Constantinople— it would be at once improving to you and agreeable to my feelings.'"

We leave Dickens at this point, as the continuing and intertwined dramas of Martin, Pecksniff, and the sisters grim, and a huge cast of other notable and equally obnoxious characters become rather convoluted and Gordian. The story does end however, although not everybody lives happily ever after. Martin and the venerable Pecksniff have a severe falling out, instigated by Pecksniff for monetary gain; Martin hits the road a thoroughly half-educated architect and, in seeking his fortune like the three little pigs, eventually reaches the fair shore of America.

Martin then becomes enmeshed in a land deal which he knows will establish his fame as an architect. It not only bankrupts him but also crushes all of his architectural vision. Unscrupulous developers, it appears, existed even in those far-off days. Martin ends up a failed and dejected architect, returns to his own England and slips rather tragically into ignonimity and anonymity. Pecksniff, for his sins, reaps a just and appropriate reward, ending up despised by all, an architect without portfolio, practice, or pupils; a man without honor, poor, pathetic, and forgotten. And there may be a moral in that for architects today.

Dickens is, of course, recognized as the acerbic chronicler of the hypocrisies and social injustices of his time. His caustic commentaries on the mores and culture of nineteenth-century England inform all of his many novels, all of his pointed parables. While one might like to shrug off his characterization of Pecksniff the architect as an exaggeration and misrepresentation— a product of the novelist's license— the consistency and accuracy of his characterizations in the other novels prevents us from doing this. Dickens was, above all, a reporter, a recorder, and a critic. The novel merely provided him with an effective medium for his social messages. His message about architects, architecture, and architectural education in mid-nineteenth-century England is horrendously clear. We, even today, tend to want to see it as a caricature, as an exaggeration, and as a fiction. Things could not really have been that way. But they were.

Sir John Soane, Augustus Pugin, John Nash, and many others were the Pecksniffs of Dickens's day. While most of these recognized architects were not given to the excesses of the Dickensian Pecksniff, their less prominent and certainly less socially acceptable peers most certainly were. The memoirs and biographies of George Wrightwick, Pugin the Younger, Gilbert Scott, C. J. Matthews, and Thomas Wayland Fletcher make that

abundantly and factually clear. The parallels between their experiences, and the persons and peculiarities of their mentors and teachers, are eerily close to what I will call the Pecksniff Paradigm.

That paradigm relies on the educational system and tradition of pupilage, which depends on a specific type of relationship between a scholar/tutor and his or her pupil. Pupilage was the way architects became architects in Dickens' day:[3] The Pecksniff Paradigm— arbitrary, capricious, and senseless as it was or as we feel it was—was in fact the prevailing model for architectural education and professional qualification in nineteenth-century England, and in Europe and in America.

Although pupilage as a system of architectural education is an eighteenth- and nineteenth-century phenomenon, its roots clearly lie in the sixteenth-century rebirth of classical culture and classical ideals.[4] Its origins as a system of education are without doubt Platonic, its precedent as a system of architectural education unarguably Vitruvian.[5] As one of the many systemic rediscoveries and re-inventions of the Renaissance, it rapidly replaced the tradition of apprenticeship which had evolved as the primary vehicle for craft, professional and academic education in the general history of western culture.

The guild or college system was refined to a high degree during the medieval period, and its impact on the education of the "professional architects" of the period was significant. The medieval tradition, with its strong emphasis on the "whys" and "hows" of architecture and its reliance on emulation as the primary mode for education became, through this shift to the concept of pupilage, replaced by new emphasis on the "whats" and "whens" of architecture, with a new reliance on imitation as the primary educational mode. The master/apprentice relationship which had characterized the traditions of architectural education from Babylonian times (with a brief interruption in the classical period) was replaced by the scholar/pupil relationship, and the twin ideas of scholarship and erudition for the first time entered the realm of "modern" architectural education.

Scholarship, and ultimately erudition, have two prerequisites for their existence. The first is an extant body of information and easy and general access to that information. The second is a definitive framework within which that information can be organized. The Gutenberg press gave access to information in a way which was inconceivable prior to its invention; the rediscovery of the classical language gave architecture the definitive framework within which that information could be organized, structured, presented, and defended. The treatises of Alberti, Scamozzi, Serlio, Filarete, and Palladio are, with the exception of the Ten Books, the first scholarly works on architecture: their authors the first erudite architects after Marcus Vitruvius Pollio. The role models provided by the venerable six quickly became the expected demeanor for the successful architect of the seventeenth, eighteenth, and nineteenth centuries in Europe, and in the more fashionable regions of America.

The age of the literate dilettante— the gentleman scholar and gifted amateur— dawned on the horizon of architectural education and architectural practice. Membership in the London Society of Dilettanti flourished. John Shute, Sir Henry Wotton, Lord Burlington, Vanbrugh, Christopher Wren, Inigo Jones, the Adam Brothers, Thomas Jefferson, Benjamin Latrobe, John Soane, Augustus Pugin, John Nash, and a legion of others struggled to fit themselves into this new professional suit, as it had become startlingly clear that in this case the clothes— and particularly the vestigial cap and gown— really did make the man. Nicholas Hawksmoor, John James, Isaac Ware, and Mr. Flitcroft, master craftsmen brought up and trained in the guild tradition, clearly declined to apply for membership and grace the halls of that special club. Unsung heroes all, their contribution to the discipline is only now being evaluated and understood.

The architectural press burgeoned, with treatises rolling off the presses by the score. Commentaries on the works of Vitruvius, Alberti and Palladio were the scholarly staple

of the day. Commentaries on those commentaries the grist of the scholars' mill.[6] The publish-or-perish syndrome, which we see as a diabolical invention of twentieth-century academia, is clearly anything but that. It owes its impetus to the evolution of the structured pupilage system in eighteenth- and nineteenth-century England. The assumption that expertise and ability are supported by print was entrenched in nineteenth-century practice, and each architect, to echo Pecksniff's sentiments, "scribbled, though many were not yet published." It was easy to appear erudite, and even easier to appear scholarly, and it was clear that erudition and scholarship were the very stuff of fame and fortune.

The Pecksniffs of the day quickly adopted the new and dressier style, knowing that while in their case the clothes might not make the man, they would most certainly make the money. A little knowledge may well be a dangerous thing. A little knowledge of the arcane and esoteric discipline of architecture could seem almost awful in its profundity, and would apparently guarantee what in those days was called a living, and a handsome one at that. It is hardly surprising that the old maxim "those that can, do, and those who can't, teach" originates in this period, and seems to have been born of the Pecksniffian abuse of the new pupilage system, the new educational paradigm.

Charles Dickens, through the vehicle of his novel, engages and directs our attention. He leads us, directly and for the most part without protest, to the realization of some stark and troublesome realities of our professional and educational history. He, through the lenses of Martin Chuzzlewit and Mr. Pecksniff, focuses our attention on the social and cultural dangers inherent in the idea of "the erudite" and more pointedly "the erudite architect": in the cultivation of architectural knowledge not for its own sake, but for our own sakes. He gently chides us for the almost arrogant way in which we deal with knowledge as a commodity or currency, and warns us stridently of the dangers inherent in our unfortunate tendency toward the creation of realms deliberately arcane and esoteric: in establishing strange intellectual landscapes all too easily colonized and occupied by imitation and imitators.

Dickens characterizes the pupilage system as arbitrary, capricious, dangerous, and inherently flawed. He raises grave doubts about its necessity, and more specifically its validity and its morality. His caustic characterization of Pecksniff is in many ways cruel, portraying him not only as a cad, a bounder, and a rascal, but also as a pretentious "puffer" or charlatan— a bag of wind with little or no real substance. It is troublesome and worrying that this characterization of Pecksniff is not just a caricature, but is instead an accurate historical and social comment on the state of architectural education and architectural affairs nearly a century-and-a-half ago. For if that is indeed the case, if Pecksniff did indeed occupy that "memorable two-pair front," then our contemporary educational and professional systems could in many ways exist as Mr. Pecksniff's legacy: they could follow what I have called the Pecksniff Paradigm.

Notes

1 Dickens *The Life and Adventures of Martin Chuzzlewit*. The quoted material appears on pages 14, 15, 16, 85, 86, 93, 94, 95, and 198 in serial order.

2 Dickens *Chuzzlewit*, 14. Dickens's use of the term "science" to describe Pecksniff's awesome knowledge of architecture is a product of philological usage in his time. It refers to Pecksniff's knowledge of the theoretical basis of the discipline, and is used in the sense that 'ratiocinatio' is used by Vitruvius in I.I.1 in the Ten Books. The Vitruvian distinction between craft and theory, and between practical and intellectual knowledge, was synonomous with the "art and science" distinction which existed in Dickens's day. Art, in that definition, had not yet come to mean art as we accept it today, but referred to the understanding of the craft or crafting of architecture.

3 Kostof *The Architect*, 197-98.

4 Miedema "Over de waardeering van architekt." Miedema in his essay describes the transition from the guild-based education of the architect in early sixteenth-century Flanders to the scholarly text or treatise-based educational system originating in fifteenth-century Florence. His description of this transition in Flanders provides us with a clear model for the probable pattern of the spread of the pupilage system in other parts of Europe and England.

5 Vitruvius *The Ten Books*, I.I.2 and I.I.15 and 16. Vitruvius, in his comments, recognizes the dangers of "erudition" and makes it quite clear that an encyclopedic knowledge of theory and literature, when separated from an equally clear understanding of the craft of the discipline, is inherently dangerous and even erroneous.

6 Kostof "The Architect," 188-91.

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Amphibious Thinking: Wet Brain/Dry Brain

Sidney K. Robinson
University of Illinois
Chicago

The power of "both/and" as opposed to "either/or" derives from keeping as many alternatives as possible in play for as long as possible. There is a prejudice that creativity rises from this rich soup of possibilities. There is an opposing prejudice that creativity is the discipline channeling such formlessness. What follows is a muddling together of these notions to demystify creativity in architecture.

The secret of creative thinking lies in the crossover maneuver mastered by newts and other amphibians. Reenacting the momentous crawl from the sea to the sand upsets a comforting singularity by keeping two worlds in view. Architectural design is an unstable mix of dry rules and misty insights. Gravity and water, for example, are intractable conventions whose direct lines of travel are only momentarily deflected around places where we fashion our myths.

When dealing with the crossover phenomenon, there is a point where amphibious shades off into ambiguous. Consider the newt. It starts in the water. After several months it crawls out for a two- or three-year stint on land clad in orange garb. Having had enough of this bright life, it changes costume to a complementary green and slides back into the water where it stays, more or less, and breeds. This wavering uncertainty is a sign of a serious lack of character. The infantile resistance to taking a stand and learning to master a mode of thinking that can be relied on is most disturbing. Behavior such as this is anything but reassuring. When you ask for an answer, you do not turn on the meter and wait for the respondent to soak or wring out his brain trying to decide where to hatch an idea. Reliable, confident results are what ultimately keep the rain out and the roof from caving in. A good idea is hard to find, and all this talk about ambidextrous thinking leads one to believe that suppleness is all that is required. I, for one, would rather not live in a building held up by supple columns.

The proper proportion for ambiguity is given by nature herself. The amphibian community is anything but a majority on this earth. That should tell us something about the value of making up one's mind. The newts may be an object lesson, but they are a minority party in the animal kingdom. There are reasons for taking things as they are and not trying to back up along the line of development searching for a puddle of primeval ooze in which to splash about.

Recreating the original moment of indecision is a seemingly timeless way to locate creativity. Creativity, however, was invented in response to the progressive dismemberment of a traditional structure. For example: when building was the province of a craftsman's common sense, based on tried and true methods, being creative made no sense at all. When the power of analysis began to take the world apart and manipulate the resulting pieces, the formerly "necessary" connections embodied in tradition were broken. One did not have to take the world straight. Its parts could be rearranged, selected from places

distant in time and space, and brought together in a new configuration. The ability to make these new configurations is called creativity.

The encouragement of creativity is the result of fear that some onerous order, no longer given by the "nature" of things, but imposed by sinister forces of social or economic convention, is about to descend on us. The avant-garde arms itself with creativity to resist the hegemony of the dim-witted or the self-serving. The sparkle keeps things popping.

It is not surprising that destabilizing of the familiar generates resistance itself. Creativity takes risks. It challenges the accepted. It is almost always impolite as it stirs up the settled. But because the entrenched eventually becomes vulnerable, there is definitely survival value in adaptability. The suppleness required to shift tactics as the situation changes is undeniably a good thing. But once having discovered that this is a useful attribute, one can conclude that it is applicable for every job. This situation is like giving a hammer to a child who proceeds to reinterpret everything as some form of nail.

Discovering creativity under every leap of imagination, however small, is the curse of a marketing strategy that trades on the dismemberment of last year's tradition to make room for this year's. We have turned the rare gift of creativity into a parlour game and spawned an industry that encourages creativity for increasingly trivial purposes. The rare and the singular are suspect in a system whose power derives from the repeatable. The assembly line and the ballot box put high value on equality and agglomeration. The consequences of any dominant singularity should direct contemporary discussions of creativity.

Creativity becomes doubly vulnerable when the laughter of derision is added to the shudder of dread. The laughter may, in fact, be sold to conceal the dread. Making a toy out of something disturbing is one way to disarm it. When creativity is marketed as a commodity, either by academics or fast-buck artists, it becomes commonplace, which, as you can clearly see, is a contradiction in terms. When any rearrangement of existing fashion, or the introduction of a new color, is hailed as a creative act, the notion is devalued to the merely diverting. Playing to the marketplace, titillating jaded taste, produces an expectation for change that only makes it more of the same. The right brain/left brain popularization of creativity is a simple case of hucksterism. The very circumstances that produced the idea of creativity will inevitably disperse it as a noble gas. The forces that undermine tradition will eventually atomize everything. Self-consciousness, analysis, and marketing whether for money or tenure, will make the unique commonplace in no time. Just as Andy Warhol predicted.

Architects are caught in the dilemma of shoring up the traditional as well as dismantling for change. As the burden of professional liability increases, derision and dread are both to be avoided. Being too far in advance of the actual shift or realignment runs the risk of losing the investment or of seeming the fool. Being perceived as engaging in trivial pursuits nearly guarantees dismissal or, worse, indulgent amusement.

What is most often looked for, especially in the hard world of building, is predictable, solid achievement, and an implied or explicit guarantee that a proposal, based on past experience, is reliable and as risk-free as possible. As decisions need to be made with increasing rapidity, the creative individual, puttering, temporizing, fiddling around with restructuring dominant conditions, produces only frustration and exasperation in those waiting for and paying for the products of inspiration.

Who has the right to be creative presents another problem. By making creativity an issue, we suggest that we are the ones who will take care of that department and anyone with whom we work had better recognize our preeminence in that area and simply do our inspired bidding. That holds true in our own offices and it certainly holds true for our

consultants. We have already rearranged the tried-and-true; others need only accept the new tradition we have created and work dutifully within it.

This jaundiced view of creativity is presented to warn off unwarranted expectations about its usefulness in the short run and to pose some doubts about trying to teach it. When architects were freed to do anything they liked by linking up heretofore disparate meanings, materials, and forms into new and "original" concoctions, some kind of order or control was needed to avoid whimsy or license. Discipline in designing became a self-conscious activity made necessary by the departure of necessity.

The question of creativity turns on who does it and when is it done. The arrogation of the practice unto ourselves is unacceptable. And the ideal that it somehow should become a habit is unreasonable. A class in creativity at least suggests that three time a week we will gather together and sparkle uncontrollably. Creativity is intermittent and unbidden. It is a surprise. It is poetry separated by pages and pages of prose. As Mies suggested: "I am working on architecture as a language. You have to have a grammar in order to have a language. You can use it [for] normal purposes and you speak prose. And if you are good at that, you speak a wonderful prose. And if you are *really* good, you are a poet. [With] the same language."

If we instill a self-consciousness about being creative in students, if the society at large buys such advertisements, we will certainly have earned the right to starve in a garret. Firm competence rather than misty propositions earns respect. To characterize the conditions in which we work and toward which we educate as an opposition between benighted philistines, plodding along in a deepening rut, and magicians who can bestow salvation through a touch of a 2B wand is the stuff of storybooks.

Undue attention to creativity is troubling on two counts: first it acknowledges the fatal split history has produced in tradition, and then it obscures that rupture with a technique touted as naturally healing. Creativity is both the symptom of rupture and the means to mend it. This dual significance makes it an important representative of the modern condition.

Ryoji Suzuki

A Photographic Essay

An Architecture of Fragmentation: The Japanese Example

Botond Bognar
University of Illinois
Urbana-Champaign

The buildings to be introduced here in a photographic essay are among the latest ones in recent Japanese architecture. They embody a wide variety of design intentions, sensibilities, and purposes that could appear as different as the buildings themselves. In one significant aspect though, they are similar; they all manifest a unique fragmentary quality that prevents them from adding up to finished entities and unified forms.

In this architecture, similar to the cultural and urban landscape in which these works have been conceived, scattered elements, incongruous motifs and materials, fractional and ruptured membranous surfaces, disjunctive forms, and labyrinthian spaces are encountered as liberated and floating signs or symbols. Yet, the apparently unrelated and often contradictory parts and patterns, due to some magic or alchemy, seem to "perform" magnificently in their collaged assemblage; they are brought together along a unique order, where neither opposition nor reconciliation occurs.

In such integration without synthesis, totality cannot be and is not presented visually in a state of completeness or perfection; the whole remains elusive to be conjured up by the perceiver with the help of memory and imagination. These fragments then are traces of an absent totality to be reconstituted with alternative possibilities. In other words, totality in this architecture is unstable and threatened at any moment by disintegration.

These buildings remind us of the poignancy of things on the verge of disappearing or, conversely, at the moment of emerging. Experiencing them is a process of suspending architecture in a perpetually evanescent and temporary state of "in-between" where becoming and fading away, growth and decay, presence and absence, reality and fiction, silence and speech take place simultaneously, or perhaps are one and the same thing. It is in this sense that these designs evoke the images of elusive phenomena—twilight, shadows, clouds, etc.—and gain a certain ephemeral quality.

It is increasingly evident that such fragmentation destabilizes the fixed or one eye-point perception; it demands that the observer acquire a multifocal perspective in order to interpret and intuitively understand the reality of this architecture. It is a mutual yet critical engagement between the interpreting subject and the interpreted object tying the person into the world by a multitude of "invisible" threads. Objects suspend their objective character while subjects relinquish their subjectivity; they are bound to lose their independence and opposition. Here neither the created world nor human beings can claim a self-contained and delimited autonomy.

The avant-garde of Japanese architecture seems to pursue at an amazing speed a path that aims at critically addressing and questioning the prevailing Western mode of understanding, definition, and meaning of space, form, and architecture. In reinter-

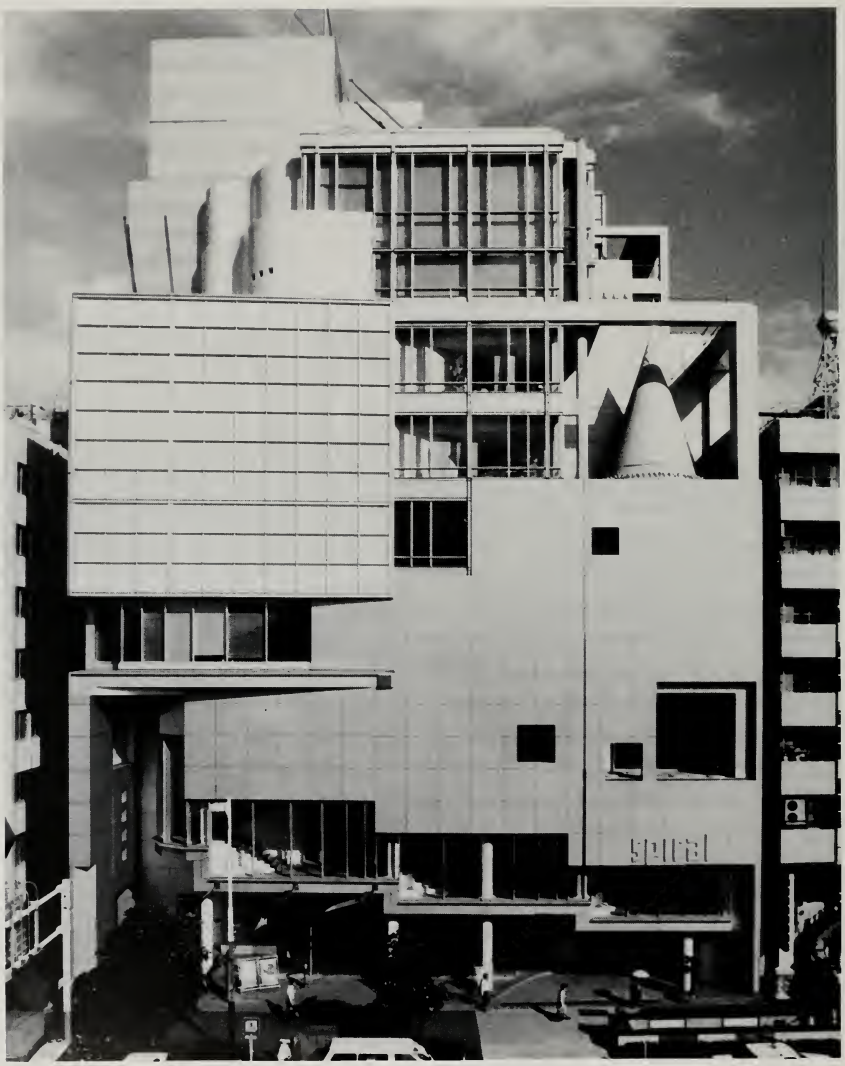
preting certain Japanese architectural themes these architects in Japan are in a conscious process of "deconstructing" the rationality and logic (*logos*) of Western classical order and metaphysics that have always been predicated by the myth of immutable and dominant laws of a ruling totality, the unity and absolute presence of a uni-verse, from which disturbing heterogeneities have been systematically expelled. This new architecture in Japan is taking shape at an equidistance from both contemporary Post-structuralist thought of "deconstruction" and the oriental Japanese philosophy of a "floating world," while engaging itself in what may be called, in Michel Foucault's words, "an archeology of the human [consciousness]."[1]

Note

1. Foucault, Michel *The Order of Things: An Archeology of the Human Sciences* Vintage Books (New York) 1973

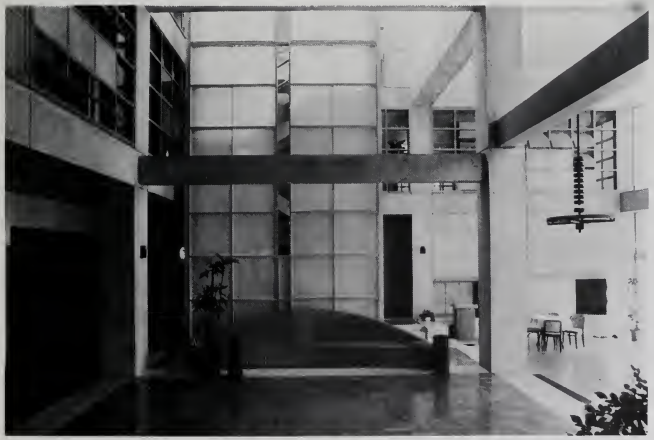
All photographs are by Botond Bognar.

"City within architecture." The fragmented parts and facade of twelve vertical strata in Hiroshi Hara's Yamato International Building in Tokyo (1987) are intended to appear as an epitome of Japanese urban scenery.



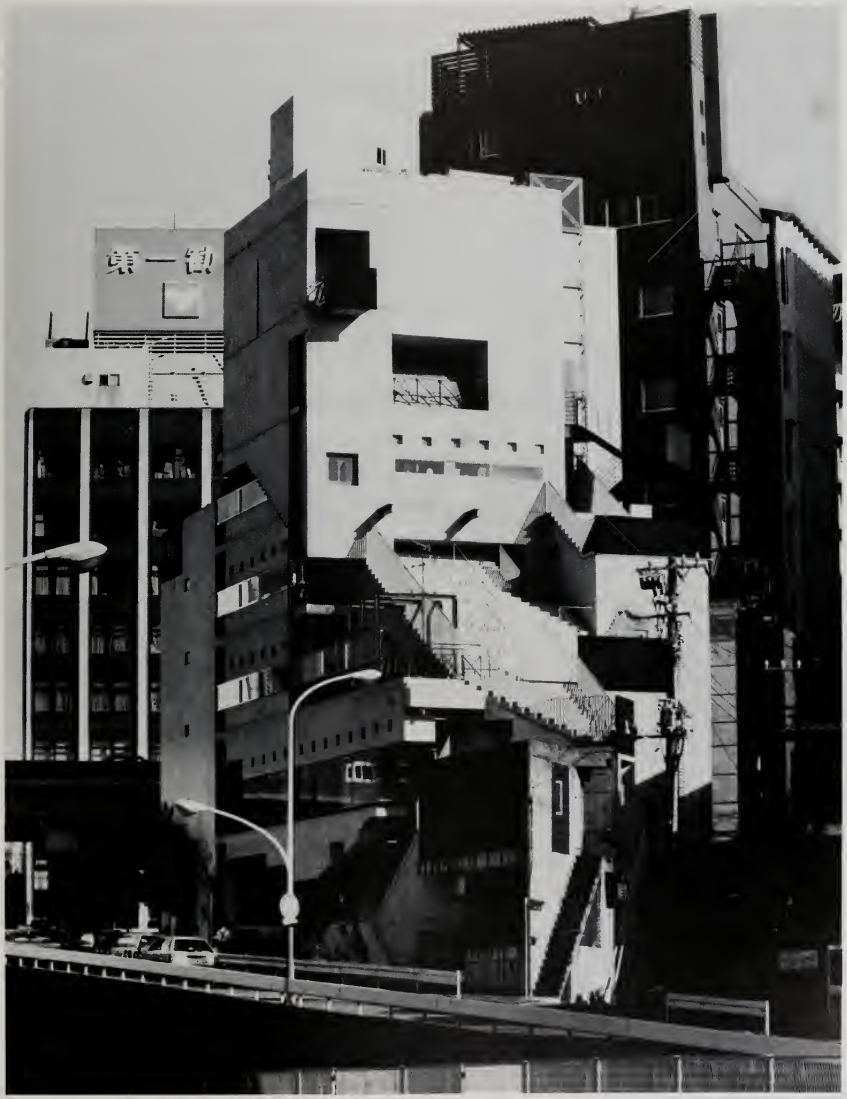
Fumihiko Maki has characterized his 'Spiral' Building in Tokyo (1985) as an aggregate of "active, heterogeneous parts that never conform to a formula" in generating the whole.

The undefinably porous fabric of space within a private residence by Ryoji Suzuki in Higashi-kurume, Tokyo (1985), is meant to cancel the "closed circuit," one-to-one correspondence or preestablished harmony between form and material.



Punctured and layered surfaces, and the skeleton of the structural frame break up the unity of the interior in Maki's YKK Guest House in Kurobe (1982).

Diagonal stepped lines and surfaces, ruptured membranes, and sharp incisions help Ryoji Suzuki to crack open the "architectural object," his 'Edge' Building in Tokyo (1987). His is an act of excavating architectural fossils and "unearthing [the layers] of man's past buried deep in the collective memory." Suzuki proves that 'demolition' can serve as an act of revelation.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Instead of maintaining formal unity along a contextual approach, Hiromi Fujii chose to "deconstruct" the existing old storehouse in his Ushimado International Arts Festival Building of 1985, by way of a series of transformations, suspending architecture between reason and experience. Fujii writes: "transformations of formal and spatial codes of architecture, if repeated, cause forms and spaces to lose their coding and to become eventually traces of their originals. The meanings that the forms and spaces possessed before their transformation is neither retained nor entirely eliminated in the traces. These traces . . . exist in an intermediate domain . . . ; they neither blend nor contrast . . . ."

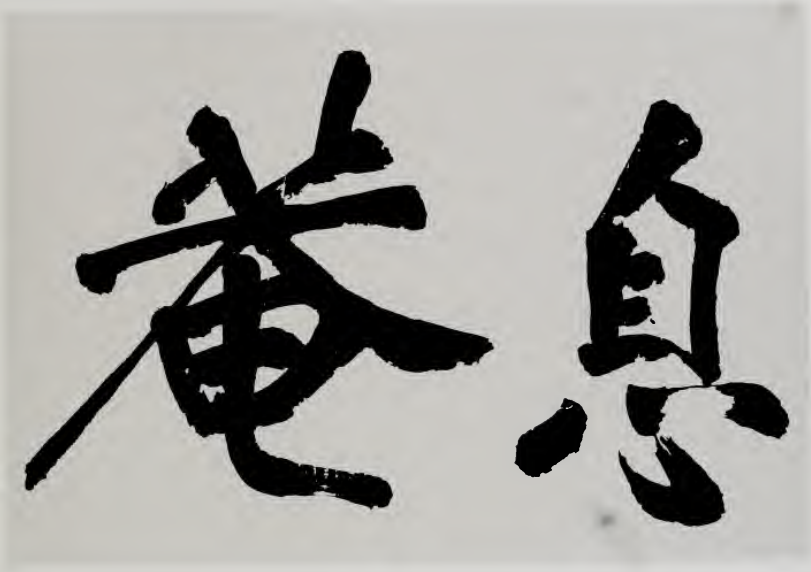
A Critical Afterthought

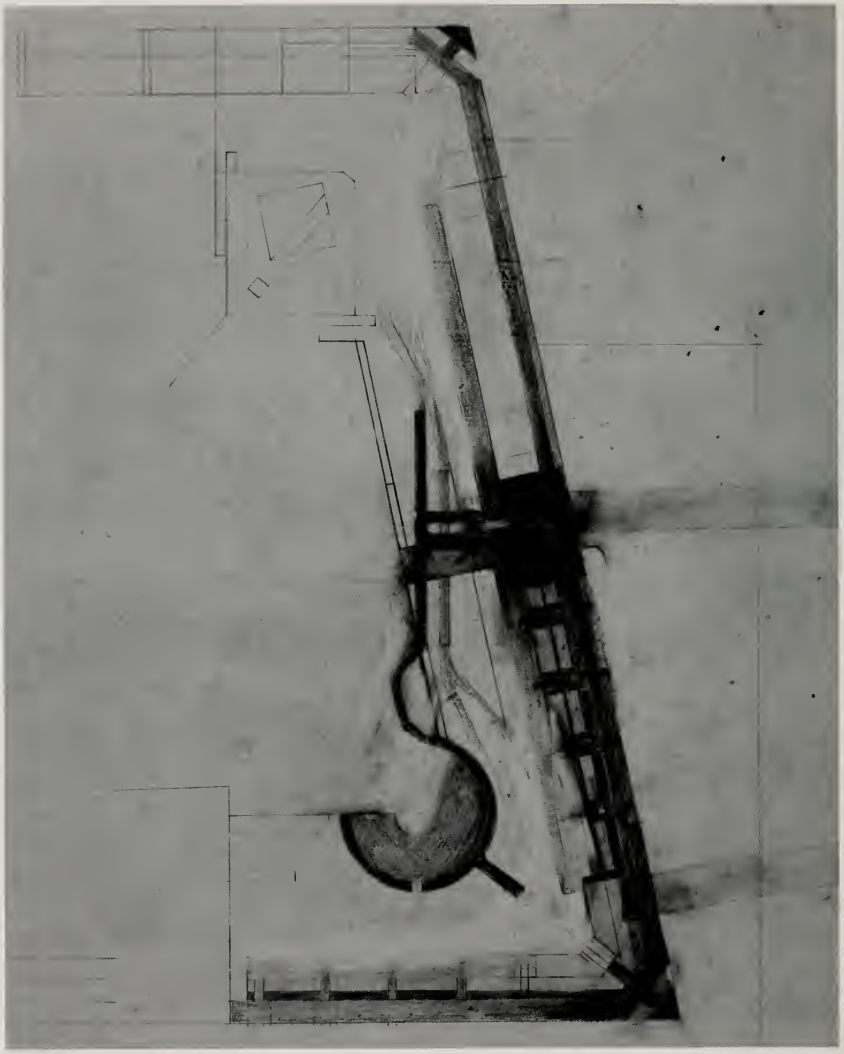
The Machine in the Studio

"This will kill that. The book will kill the building." These were Victor Hugo's words about the prospects of architecture with the arrival of the mass-produced book. Hugo stated that since the Renaissance, architecture had been forced to yield its communicative role to the written word, but that with the appearance of mass-distributed media the death of the "book of stone" (Notre Dame was the quintessential book of stone for Victor Hugo) was certain. He predicted the end of any symbolic role architecture still might have. As we know, architecture survived. But we also know that architecture is no longer the same as it had been. One could even argue that the triumph of functionalist architecture was possible only because of this process of medium change that had started long before the Modern Movement asserted itself. Right now, as a reaction to the meaningless architecture produced during the sixties and seventies (which surely was not the objective of the Modern Movement), it is demanded and hoped that architecture again take on a symbolic and communicative role, that it again narrate, that it again is text. This happens at a time when television, the successor of the book, receives its complementary twin in the form of the mass-produced computer. What television and computer combined will do to the book is open to speculation; very likely another displacement will occur with regard to meaning. Previously, meaning left the book of stone, thereby leaving also the public realm, to hide between two covers, to find a papery and two-dimensional existence. Lately, people began to believe that meaning resides in television images; now it is in danger of becoming digitized. Let us hope that this continuous trivialization of meaning is actually not occurring, that meaning has found a new place and we just do not know where that place is. Aside from this problem one also may ask what the computer will do to architecture. Will the computer kill architecture, something the book did not achieve? Probably not, if we are lucky; but it is very likely that architecture will change again, will not be what it has been until now, as a result of activities dominated by the demands and rules of a machine.

It is rather amusing to watch the frenzied manner with which schools of architecture embrace the computer—the savior has finally arrived. Nothing bad can happen anymore the moment each studio is bristling with the new and shining armor. As if it were not common knowledge that each time mankind has achieved a technological breakthrough or invented a new gadget, a certain price had to be paid. There is no doubt that the computer will be highly useful for a variety of architectural activities. But it is perplexing that the acceptance of this tool is done in such an uncritical fashion, that hardly any deliberations occur as to the limitations of this instrument or its impact on the essence of architecture.

There is the strong possibility that the use of the computer will revive and further expectations that architecture can finally be turned into a science, that is, that design activities can be objectified and made completely ra-





Drawing by Raimund Abraham

tional. It is worth recalling that the much-maligned Modern Movement held similar beliefs and that its ultimate failure may have been caused by this belief or its implications. Obviously, that has already been forgotten, at least by those who promote the computer in the studio without reflection. With the availability of more sophisticated architectural software, a false sense of certainty could be created, a sense that through the application of the computer the best possible solution is a logical consequence, a guaranteed, instantaneous outcome. The "instant society" will then be able to claim another victim— no time anymore for the arduous task of developing design ideas, no doubts anymore about the results of these developments. It is not too farfetched to assert that the use of the computer will unduly emphasize the programmatic aspects in architecture. In other words, designs will mainly be generated and determined through programming efforts, and that in turn will lead, via diagrams, to a functionalistic architecture whereby form and other aspects will remain mere appendices or become quantifiable variables in the programming process. It is ironic that not so long ago the proposition "form follows function" had been declared the worst architectural credo ever. Now the machine will not only bring back functionalism but essentially control its new ascendancy, with the result that human needs and behavior will again become abstractions. The design process will be determined by one method only: the sequential ordering of design steps prescribed through a set of operational rules (which presumably will be pinned to the computer panel). Donald Schon recently warned of the increasing "technocratization" of the profession, which is actually a reductionist development, and of the growing inclination to "proceduralize" practice. Both trends will be reinforced by a strong reliance on the computer; but there is an additional problem. Given the insatiable appetite of the computer for facts, architectural knowledge will be transformed and reduced to bits of information fed into the machine whose synthesizing capability is just a programmed one. That is to say, architectural knowledge will also undergo a regressive transformation, it will become data. The field of architecture, already under siege by other professions for dominance in the building process (the battle about the shares has long been lost), will be inclined to tie its expert status to computer performance and consider it the hallmark of an expert if he is proficient in systems analysis gibberish— the design process as "corrective feedback paradigm" and architecture as "output of input." Unfortunately, this path taken to enhancing expertise, by some euphorically, by others who see the writing on the wall as a last straw, will negate the essence of architecture and, thus, could become a lemming's path. Expertise should be based on the essence of architecture and not some instrumental aspect. At any rate, gaining expert status through the use of the computer is a game which is much better played by those professions who challenge the role of architecture in building.

It appears that the computer is going to create quite an array of negative implications for architecture and not just advantages as some would like us to believe. Aside from the ones just indicated, the aspect which could be impaired the most seems to be creativity. Admittedly, one can creatively use the machine but this should not be confused with creativity. What is quite often overlooked is that the creative process is formatively influenced by the medium used, and there is good reason to suspect that the computer is not the appropriate medium for this process.

We all admire the effortless grace of Asian calligraphy, its vibrant yet tranquil appearance. The time spent on creating such a masterpiece is minimal compared to the time used for selecting paper and brush, for preparing the ink, and infinitesimal compared to the time necessary for gaining mastery. The paper's characteristics should be in tune with mood and content of the chosen text, its surface subtly responsive to the strokes of the brush, receptive with an exact touch of resistance. The brush should be supple but firm, allowing for utmost accuracy and line yet permitting also chance developments, controlled mishaps. The ink should provide an unpenetrable surface which nevertheless is suggestive of depth. The selection and preparation of materials and tools becomes a

prolonged meditation process culminating in the creative moment.

No one in his or her right mind would suggest the use of the computer in calligraphy. Everything just described differs from the way a computer is being used: there is no need to spend the better part of a lifetime for achieving mastery; a crash course will suffice. There is no careful selection or preparation of anything, no meditation process. One just sits down in front of the plastic box and hits the keys or moves the "mouse"; there is no symbiosis between text and machine, just a mechanical dependency. Some will argue that to use calligraphy for analogous argumentation is misleading since calligraphy differs substantially from design. It does, but there is an important similarity, and that is in the intricate and complex relationship between both activities and the medium they use. In this sense, the drawing stage of design, which is also its creative stage, is identical to calligraphy. It is wrong to assume that the well-known preferences of renowned architects for certain kinds of papers and drawing tools are irrelevant idiosyncrasies that bear only anecdotal value. Their selection is based on long experience and deep intuition or on a "sense of rightness," as Louis Kahn would put it.

Raimund Abraham most succinctly describes drawing as a process of layering and cutting. It should be evident from this statement that only a material which permits these actions is conducive to drawing. But there is more to it than meets the eye; for Abraham, drawing is understanding. That is to say, understanding, in its subconscious and conscious forms, is intimately connected to the very specific process through which a drawing evolves. Architectural knowledge is thus embedded in a drawing culture which, in turn, is based on materials and tools. In this sense, architecture has always been a craft where learning (institutionalized and otherwise) occurs through drawing: to think is to draw. It is clear that any inroads on this drawing-cum-learning culture would not only jeopardize essential skills but erode the fertile soil in which architecture roots and impair that special kind of understanding that guaranteed the expert status of architecture for so long. The advent of the computer in the studio comes at a time when this drawing culture is already in danger of disappearing, of being misapplied or perverted. Architectural note-taking in the manner of sketches, which is also a form of understanding— to note the essential aspects of an object— has, for quite some time, been supplanted by the camera, another machine, which is mainly useful for quick recording but hardly conducive for understanding. Lately, the deplorable notion has gained ground that the sole justification for good drawing skills rests in their usefulness for presentation drawings. In other words, whatever drawing culture still exists is largely being used for selling an idea ("artist's" rendering in developer brochures) instead of discovering and creating an idea or, in a more sophisticated perversion, for consumption or connoisseurship purposes in certain journals. Schools of architecture and professionals alike, in a rare unity, seem to have forgotten that a drawing culture is essential for creativity in architecture.

There is still another aspect which needs to be mentioned with respect to the relationship between creativity and chosen medium. Each creative act is affected by personal feelings, emotions, and moods, and these aspects leave a mark or trace behind. Probably the most receptive medium in this regard is the musical instrument, but there are others which are quite susceptible as well: the canvas of the painter (Pollock's fury), the clay of the sculptor (Giacometti's melancholy), the sheet of the draftsman (Piranesi's depression). The design activity is not immune to such influences, regardless of the fact that this is hardly ever discussed or admitted— out of embarrassment? The computer is utterly unresponsive to this very human side of creative activity. It does not matter at all in which kind of mood we are in the moment we position ourselves vis-à-vis the computer; the machine does not care whether tears are streaking down our faces or whether a blissful or mischievous smile is on our lips. It is all the same to the machine; no trace of sadness will appear on the screen or on the print- or draw-outs. The computer

functions like an impenetrable filter. Not only does it effectively screen emotions but it also blocks the subconscious flow which is so vital to creativity, since its operations demand a very conscious state of mind. The advice given by a Zen master to his pupil to become first a tiger before attempting to draw a tiger would be totally irrelevant, or outright ridiculous, if uttered in a computer room.

Will the computer kill architecture?

Not if we are able to tame the "beast," that is, to control the machine to the extent that *its logic does not determine the design process.* It must remain an instrument applied only with full awareness of its limitations and potential dangers. The computer is useful for programming activities, especially of a complex nature, as long as this does not constitute a shortcut or become the sole route for arriving at a design solution. The computer can be used as a tool in the implementation stages of the design process, for instance, to alleviate the drudgery of producing working drawings and to assure easy and controllable modification in their case, but it has no place in the creative part of design. The computer is of great help to store, retrieve, and organize information, but this remains positive only if we can uphold the crucial distinction between information and knowledge and safeguard the latter from the corrupting influence of the machine.

Even if these caveats are heeded, there remains the uneasy feeling that the computer could become Pandora's box for architecture, given the current technomania in society. This mania is no longer just a belief that technology can solve all of our problems (the foolishness of this simplistic notion of progress is overwhelming); it has become a lifestyle as well—a life-style which is characterized by a mentality that considers the push of a button superior to any other activity (all else is seen as a remnant of the stone or dark age), a life-style in which the "ecstasy of communication," to borrow a phrase from Jean Baudrillard, no longer takes place between human beings, but transpires between man and machine. Previously, it was nature's fate to become mechanized. Now it is man's turn. Whether architecture can under such circumstances live up to the demand to communicate and symbolize again remains to be seen.

Johann Albrecht